exSILentia®

User Guide

SILstat™

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Contents

Part 1

Introduction

Chapter 1 Introduction

SILstat™ is the life event recording module of the exSILentia® Safety Lifecycle tool. Used during operation and maintenance, SILstat™ provides insight to the performance of your safety systems on site, simplifying the collection of critical data, and contextualizing results for comparison of key metrics to assumptions made during your SIS design.

SILstat leverages your project work from PHA, LOPA, SRS, SIL Verification and Proof Test definition for easy database configuration. This builds a dynamic plant hierarchy that captures the physical location of your safeguard devices as well as the logical relationship between elements of your safety functions.

SILstat gives context to data collected on process demands, proof tests, failures, and repairs. With curated Dashboards, Insights, and Reports, performance metrics are communicated to key personnel throughout a team or organization. The table below provides an example of event data and the output metrics.

Event Data	Output Metric
Hazardous Event	Actual vs. Assumed Initiating Event Frequency
On- Demand Success/Failure of Safeguards (IPLs) and SIFs	Actual vs. Assumed PFD and Failure Rates
Testing Performance for Proof Tests and Routine Maintenance	Actual vs. Assumed Proof Test Intervals, Failed tests contribute to failure rate analysis
Tracking Bypasses, Repairs, and Management of Change	Actual vs. Assumed Mean Repair Time and Mission Time

With the information recorded you can determine if the performance metrics you assumed during the Analysis and Design and Implementation phases of the Safety Lifecycle adequately represent actual performance. In case actual performance is better than predicted you can argue that your SIF is over-designed to protect against a specific hazard. This would allow modification of the design and required risk reduction implementation in future applications and can provide potential cost savings. In case actual performance is worse than expected, the process hazard might represent a higher risk than originally estimated, or the SIF does not perform as well as expected. In this case additional risk reduction measures must be implemented to ensure tolerable risk targets are met.

The user guide is divided into 6 parts:

- *Part 1 Introduction*
- *Part 2 SILstat Settings and Libraries*
- *Part 3 Configuration*
- *Part 4 Collection*
- *Part 5 Analysis*
- *Part 6 Miscellaneous*

Part 1 of this user guide provides this introduction, including an overview of what to expect when launching the SILstat software. the various license platforms and installation of the software on a local PC, as well as a high level overview of each of the software modules within the exSILentia® Software. Part 2 covers all steps needed to getting you started using the SILstat software ranging from initial setup of the SILstat environment to an understanding on how data is stored with SILstat. Part 3 provides detailed guidance on the configuration tasks for SILstat, this includes setting up the various hierarchies and defining devices that data is collected on. Part 4 describes how data is collected using SILstat, ranging from recording hazards / initiating events and device failures to performing proof tests and maintenance activities. Part 5 describes how the data that is collected can be analyzed either through review of teh SILstat dashboard or through pre-defined reports. Part 6 covers Abbreviations, Terms and Definitions, Disclaimer and Assumptions as well as the exSILentia® Software License Agreement and an Index.

If this user guide does not answer your questions you can contact the exSILentia® Support Team via http://support.exida.com.

Chapter 2 Home Page

SILstat's Home Page provides quick access to items recently viewed, upcoming tasks, and data insights. The Home Page also provides links to Your Organization, Training and Help, and exida news.

You can navigate to the Configuration, Collection, Analysis , Reports, Imports, Library, and SILstat Settings using the left-side panel. Configuration and Collection can be expanded by pressing the header or downward arrow. Once expanded, grey shading will appear to show the sub sections.

The left-side panel can collapse by pressing the two left arrows at the bottom of the screen, showing an icon for each section.

The availability of the various options / menus will depend on your user role's privileges.

2.1 Landing Page

There are 6 main sections of information on the SILstat Landing Page.

2.1.1 Recent

The Recent section lists the latest items you have viewed in SILstat, ordered by the last edited. Double click on an item in the list to return to that view.

2.1.2 Tasks

The Tasks section is specific to each user, showing a list of items that need your attention. Tasks can be filtered by Approvals, Procedures Upcoming, and Drafts.

Approvals

Collection events that require your review and approval are listed here. Double click on the event to view more details.

Procedures Upcoming

Scheduled proof tests and procedures with upcoming due dates are listed here. Double click on an item to initiate an event.

Drafts

Items added to the database and left in the 'Draft' state are listed here. The Home Page will show a maximum of 10 draft items. Select 'View More' to view the complete list of drafted items. Items without a Name will be given a name by default.

2.1.3 Insights

Insights provide at-a-glance information on the configuration of your database and event data collected. The Insights show Failures, Demands, and Recorded Procedures that can be filtered to the past 90, 180, 365, or 730 days.

You can see what Areas, Safeguards, and Devices are In-Service and Not-in-Service.

2.1.4 Your Organization

Your Organization displays company information from the licensing integration system.

2.1.5 Training and Help

Training and Help shows exida's latest information on Training and Software Support.

2.1.6 Latest News

exida News displays the latest company news.

2.2 Search

SILstat's Home Page includes a Search feature you can use to search within the full application. If desired, you can filter and search specifically within All, SILstat, Events, and Admin Center.

Selecting the ‘SILstat’ filter will show results from SILstat excluding Events and Admin Center. Selecting the ‘Events’ filter will show results from Collection events. Selecting the ‘Admin Center’ filter will show results from Users and User Roles. You can also filter by label.

When typing keywords into the search box, you will immediately begin seeing results with the keywords highlighted to match. The search results display breadcrumbs where you can find where the results are located, as well as the full name, description, and associated labels.

2.3 Help

If you are having problems with SILstat, you can use the Help feature. Click on the “?” icon next to the Search Bar and Notification Bell. A new box will open the SILstat User Guide. Wherever you are in the tool, the Help will navigate to the specific area within the User Guide.

2.4 Notifications

You will be able to receive in-app notifications, including:

- Welcome Messages
- Announcements of New Releases and Help documentation
- Approval Workflow
    - Approval Required
    - Approval Accepted/Rejected
- Notifications about Imports

You will also receive notifications via email. These include:

- Welcome Message
- Approval Workflow
    - Approval Required
    - Approval Accepted/Rejected

A Notification icon is located at the top of the SILstat Home Page, showing a red dot when a Notification is available. When you hover over the icon, the number of Notifications is displayed. Select the Notification icon to view your notifications. Select ‘View’ to see more details. Select the Delete icon to dismiss the Notification.

Chapter 3 User Profile

Select your Username or Profile Picture at the top right corner of the app to view your profile. By default, your profile picture will show your initials. Once selected, you will see a menu that lists: Switch Organization, Account, Profile, and Sign Out.

Select ‘Profile’ to upload a Profile Picture and edit your First, Middle, and Last Name. You can also edit your Organization Details and Contact Information.

Within Preferences, you can adjust your Time Zone and Country / Region. You can also select your preferred Language, Date format, Time format, Unit of Measurements, and Theme.

Part 2

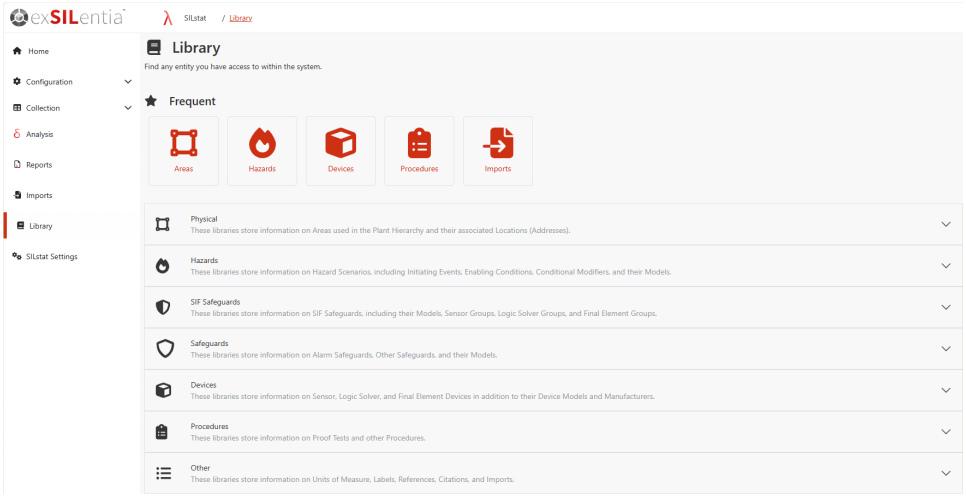
SILstat Settings and Libraries

Chapter 4 SILstat Settings

Delete this text and replace it with your own content.

Chapter 5 SILstat Library

The SILstat Library provides a centralized location for the data in your SILstat database. A library item is a unique entity that can be referenced/linked in multiple locations. Items that have been added to the plant hierarchy can be found here, as well as items that are in draft. A change to the library item will automatically be applied to all locations the library item is referenced/linked. Using libraries will dramatically increase the efficiency and consistency of the various work activities to be performed. To navigate to the Library, select the ***Library*** button on the left side panel. At the top you will see your most frequently accessed libraries listed. Under your Frequent libraries, you will see all available libraries listed.



The following libraries are defined within SILstat.

Physical Library

- Areas
- Locations
- Tags

Hazards Library

- Initiating Event Models
- Initiating Events
- Hazards
- Enabling Condition Models
- Enabling Conditions
- Conditional Modifier Models
- Conditional Modifiers

SIF Safeguards Library

- SIF Safeguard Models
- SIF Safeguards
- Sensor Groups
- Logic Solver Groups
- Final Element Groups

Safeguards Library

- Alarm Safeguard Models
- Alarm Safeguards
- Other Safeguard Models
- Other Safeguards

Devices Library

- Manufacturers
- Device Models
- Devices
- Sensors
- Logic Solvers
- Final Elements

Procedures Library

- Procedures

Other Library

- Units of Measurements
- Labels
- References
- Resources
- Citations
- Imports

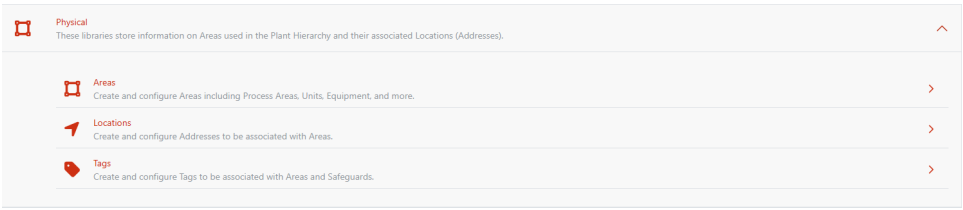
These libraries will be discussed in more detail in the subsequent sections.

Chapter 6 Physical Library

The Physical Library section contains the following libraries.

- Areas
- Locations
- Tags

Each will be described in detail in the subsequent sections.



6.1 Areas

The Areas library allows for creation and configuration of Areas including Process Areas, Units, Equipment, and more. These Areas can be used to create your Plant Hierarchy.

Select the ***Areas*** library to view all Areas in the database. A grid shows the following properties for each.

- Type
- Name
- Status
- Parent Name
- Plant Type
- Process Type
- Labels
- Action

To create a new Area, select the **New** button on the top right-hand corner of the library view. This will open the Area view. To View or Edit an Area, select the **Edit** button in the Action column. You can input the following properties for the Area.

Property	Description
Area Types	Types include Business, Country, Region, Site, Facility, Plant, Storage, Unit, Process Area, Equipment. Some selections will add properties to your Area. Units will allow you to enter Plant Types and Process Types. Equipment Areas will allow you to enter Node Types. These types and subtypes can be defined by the user in the SILstat Settings.
Name	This can be entered as text.
Description	This can be entered as text.
Comments	This can be entered as text.
Location	Locations can be added to the Location library and associated with an Area.
Assigned Procedures	Procedures can be added to the Procedures Library and associated with an Area.

The Lifecycle Section shows all events associated with the Area.

The Hierarchy section shows all Parents and Children associated with the Area. These could be other Areas, Hazards or Tags.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Area view show SIF Safeguards, Tags, Procedures, Operating Hours, Demands, and Failures.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

6.2 Locations

The Locations library allows for creation and configuration of Addresses to be associated with Areas.

Select the ***Locations*** library to view all items in the database. A grid shows the following properties for each.

- Address Line 1
- Address Line 2
- State/Province
- Postal Code
- Country or Region
- Action

To create a new Location, select the **New** button on the top right-hand corner of the library view. This will open the Location view. To View or Edit a Location, select the **Edit** button in the Action column. You can input the following properties for the Location.

Property	Description
Address Line 1	This can be entered as text.
Address Line 2	This can be entered as text.
City	This can be entered as text.
State/Province	This can be entered as text.
Postal Code	This can be entered as text.
Country/Region	This can be selected from the drop down. Options for country are pre-set.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Locations view show the Number of Areas with this Location associated.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

6.3 Tags

The Tags Library allows for creation and configuration of Tags and Subtags including Sensor Tags, Logic Solver Tags, Final Element Tags, Alarm Tags and Other Tags. These can be associated with Areas and Safeguards.

Select the ***Tags*** library to view all Tags in the database. A grid shows the following properties for each.

- Type
- Name
- Device
- Action

To create a new Tag, select the **New** button on the top right-hand corner of the library view. This will open the Tag view. To View or Edit a Tag, select the **Edit** button in the Action column. You can input the following properties for the Tag.

Property	Description
Tag Types	Select from drop down. Types include Other, Sensor, Logic Solver, Final Element, Alarm.
Name	This can be entered as text.
Description	This can be entered as text.
Unit of Measure	Use field to search for available Units to choose from, or create new Unit.
Device	Select a Device from the Device Library. These will be filtered based on the Tag Type selected.

The Hierarchy section shows all Parents and Children associated with the Tag. These could be other Tags, Safeguards or Areas.

The Analysis Section includes additional fields based on the Tag Type, these are defined in the sections below.

The Custom Data section allows you to fill out user-defined fields. These can be configured in the SILstat Settings.

The Procedures section shows all Procedures associated with the Tag. Procedures can be created in the Procedures Library.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Tag view shows Children/Sub Tags, Demands, Failures, and Operating Hours.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

6.3.1 Sensor Tags

You can input the following properties for the Sensor Tag Configuration.

Property	Description
Input Type	Select from Process or Discreet from drop down.
Process Value	Select Analog or Digital from drop down.
Range Low	Enter value in Units of Measure selected.
Range High	Enter value in Units of Measure selected.
Tolerance	Enter value in Units of Measure selected.

Select **Add** in the Profile section to add a new profile. You can input the following properties for the Sensor Tag Profile.

Property	Description
Trip Direction	Select from High or Low from drop down.
Limit	Enter value in Units of Measure selected.
Basis	This can be entered as text.

6.3.2 Logic Solver Tags

You can input the following properties for the Logic Solver Tag Configuration.

Property	Description
Input Type	Select from Process or Discreet from drop down.
Process Value	Select Analog or Digital from drop down.
Range Low	Enter value in Units of Measure selected.
Range High	Enter value in Units of Measure selected.
Tolerance	Enter value in Units of Measure selected.

Select **Add** in the Profile section to add a new profile. You can input the following properties for the Logic Solver Tag Profile.

Property	Description
Trip Direction	Select from High or Low from drop down.
Limit	Enter value in Units of Measure selected.
Basis	This can be entered as text.

6.3.3 Final Element Tags

You can input the following properties for the Final Element Tag Configuration.

Property	Description
Remote Actuated Valve	Toggle On/Off based on your Final Element device.
Input Type	Select from Process or Discreet from drop down.
Process Value	Select Analog or Digital from drop down.
Range Low	Enter value in Units of Measure selected.
Range High	Enter value in Units of Measure selected.
Tolerance	Enter value in Units of Measure selected.

Select **Add** in the Profile section to add a new profile. You can input the following properties for the Remote Actuated Valve Final Element Tag Profile.

Property	Description
Action	Select Open or Closed from drop down.
Fail Position	Select Open, Closed or Stuck from drop down.
Tight Shutoff Required	Select True or False.
Feedback Tag	This can be entered as text.

Select **Add** in the Profile section to add a new profile. You can input the following properties for the Non-Remote Actuated Valve Final Element Tag Profile.

Property	Description
Trip Action	Select On or Off from drop down.
Fail Position	Select On or Off from drop down.

6.3.4 Alarm Tags

You can input the following properties for the Alarm Tag Profile.

Property	Description
Input Type	Select from Process or Discreet from drop down.
Process Value	Select Analog or Digital from drop down.
Basis	This can be entered as text.
Range Low	Enter value in Units of Measure selected.
Range High	Enter value in Units of Measure selected.
Deviation Time	Enter time in units shown or adjust units using the drop-down.
Estimated Time to Respond	Enter time in units shown or adjust units using the drop-down.
Setpoint Selected	Enter value in Units of Measure selected.
Setpoint Rationale	This can be entered as text.

6.3.5 Other Tags

You can input the following properties for the Other Tag Profile.

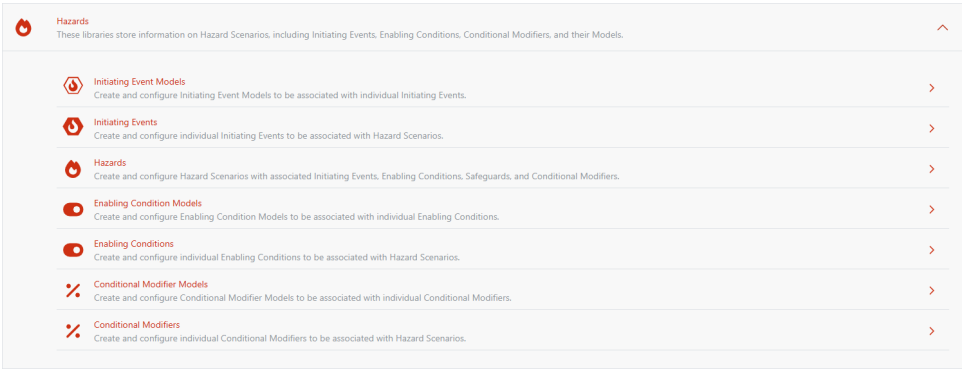
Property	Description
Trip Direction	Select from High or Low from drop down.
Limit	Enter value in Units of Measure selected.
Basis	This can be entered as text.

Chapter 7 Hazards Library

The Hazards Library section contains the following libraries.

- Initiating Event Models
- Initiating Events
- Hazards
- Enabling Condition Models
- Enabling Conditions
- Conditional Modifier Models
- Conditional Modifiers

Each will be described in detail in the subsequent sections.



7.1 Initiating Event Models

The Initiating Event Models library allows for creation and configuration of Initiating Event Models to be associated with individual Initiating Events.

Select the ***Initiating Event Models*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Assumed Frequency
- Action

To create a new Initiating Event Model, select the **New** button on the top right-hand corner of the library view. This will open the Initiating Event Model view. To View or Edit an Initiating Event Model, select the **Edit** button in the Action column. You can input the following properties for the Initiating Event Model.

Property	Description
Name	This can be entered as text.
Description	This can be entered as text.

You can input the following properties for the Initiating Event Model in the Assumptions section.

Property	Description
Assumed Frequency	Enter the value in frequency per year.
Assumption	This can be entered as text.
Comment	This can be entered as text.
Sources	This can be entered as text.
Citation	Citations can be added to the Citations Library and associated with an Initiating Event Model.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Initiating Event Models view shows Initiating Events (count that are using the models).

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

7.2 Initiating Events

The Initiating Events library allows for creation and configuration of individual Initiating Events that can be associated with Hazard Scenarios.

Select the ***Initiating Events*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Assumed Frequency
- Model
- Labels
- Action

To create a new Initiating Event, select the **New** button on the top right-hand corner of the library view. This will open the Initiating Event view. To View or Edit an Initiating Event, select the **Edit** button in the Action column. You can input the following properties for the Initiating Event.

Property	Description
Initiating Event Model	Initiating Event Models can be added to the Initiating Event Models Library and associated with an Initiating Event.
Name	This can be entered as text.
Description	This can be entered as text.

You can input the following properties for the Initiating Event in the Assumptions section. These may be based on the Initiating Event Model selected.

Property	Description
Assumed Frequency	Enter the value in frequency per year.
Assumption	This can be entered as text.
Comment	This can be entered as text.
Sources	This can be entered as text.
Citation	Citations can be added to the Citations Library and associated with an Initiating Event.

The Hierarchy section shows all Parents and Children associated with the Initiating Event. The Parents section will show associated Hazard Scenarios. The Children section will show associated Enabling Conditions, Safeguards, or Conditional Modifiers.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Initiating Events view shows Hazards and Demands.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

7.3 Hazards

The Hazards library allows for creation and configuration of Hazard Scenarios, with associated Initiating Events, Enabling Conditions, Safeguards, and Conditional Modifiers.

Select the ***Hazards*** library to view all Hazards in the database. A grid shows the following properties for each.

- Name
- Hierarchy
- Label
- Action

To create a new Hazard, select the **New** button on the top right-hand corner of the library view. This will open the Hazard view. To View or Edit a Hazard, select the **Edit** button in the Action column. You can input the following properties for the Hazard.

Property	Description
Name	This can be entered as text.
Description	This can be entered as text.

For Hazard Scenarios imported from exSILentia, the Assumed Frequency and Assumed Risk Reduction Factor per Severity Category are shown from the LOPA.

Once the Hazard is defined a Hazard Scenario Diagram will appear. This allows you to associate existing items from the library or create new items. Items that can be associated with a Hazard include:

- Initiating Events
- Enabling Conditions
- Safeguards
- Conditional Modifiers

You can create new items via the diagram, or by selecting the **New** button and choosing the item type from the drop down. This will show a new view for the item to be defined. After specifying the new item, select **Create**. Upon creation the item will be associated with the Hazard.

To add existing items to the Hazard Scenario, select the **Associate** button and choose the item type from the drop down. A panel will appear on the right-hand side showing existing items in the database. For each item the Name, Type, and Action are shown. To add this to the Hazard, select the toggle button under the Action column. This will toggle from *Off* to *On*. Once all items to be associated are switched to *On*, close the right-hand panel.

The Hazard Scenario Diagram can be viewed in Fullscreen. Selecting items in the Diagram will show associated data.

- Analyzed Frequency is shown for Initiating Events
- Assumed Probability is shown for Enabling Conditions and Conditional Modifiers
- Assumed PFD is shown for Safeguards

To re-order items, select the item in the diagram and move it left or right using the arrow buttons.

The Hierarchy section shows all Parents and Children associated with the Hazard. Parents will include Areas the Hazard is associated with. Children will show the Initiating Events, Enabling Conditions, Safeguards and Conditional Modifiers associated with the Hazard. Through the hierarchy, you can directly edit, create new, and associate any existing children.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Hazards view shows Initiating Events, Safeguards, Operating Hours, Demands, and Actual Frequency.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

7.4 Enabling Condition Models

The Enabling Condition Models library allows for creation and configuration of Enabling Condition Models to be associated with individual Enabling Conditions.

Select the ***Enabling Condition Models*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Assumed Probability
- Action

To create a new Enabling Condition Model, select the **New** button on the top right-hand corner of the library view. This will open the Enabling Condition Model view. To View or Edit an Enabling Condition Model, select the **Edit** button in the Action column. You can input the following properties for the Enabling Condition Model.

Property	Description
Type	This should default to Enabling Condition. If you prefer a different type, select from drop down.
Name	This can be entered as text.

You can input the following properties for the Enabling Condition Model in the Assumptions section.

Property	Description
Assumed Probability	Enter this value as a decimal.
Assumption	This can be entered as text.
Comment	This can be entered as text.
Sources	This can be entered as text.
Citation	Citations can be added to the Citations Library and associated with an Enabling Condition Model.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Enabling Conditions Model view shows Enabling Conditions (count that are using the models).

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

7.5 Enabling Conditions

The Enabling Conditions library allows for creation and configuration of individual Enabling Conditions to be associated with Hazard Scenarios.

Select the ***Enabling Conditions*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Assumed Probability
- Model
- Labels
- Action

To create a new Enabling Condition, select the **New** button on the top right-hand corner of the library view. This will open the Enabling Condition view. To View or Edit an Enabling Condition, select the **Edit** button in the Action column. You can input the following properties for the Enabling Condition.

Property	Description
Enabling Condition Model	Enabling Condition Models can be added to the Enabling Condition Models Library and associated with an Enabling Condition.
Name	This can be entered as text.
Description	This can be entered as text.

You can input the following properties for the Enabling Condition in the Assumptions section. These may be based on the Enabling Condition Model selected.

Property	Description
Assumed Probability	Enter this value as a decimal.
Assumption	This can be entered as text.
Comment	This can be entered as text.
Sources	This can be entered as text.
Citation	Citations can be added to the Citations Library and associated with an Enabling Condition.

The Hierarchy section shows all Parents and Children associated with the Enabling Condition. The Parents section will show associated Hazard Scenarios and Enabling Condition Models.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Enabling Condition view shows Hazards and Initiating Events.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

7.6 Conditional Modifier Models

The Conditional Modifier Models library allows for creation and configuration of Conditional Modifier Models to be associated with individual Conditional Modifiers.

Select the ***Conditional Modifier Models*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Assumed Probability
- Action

To create a new Conditional Modifier Model, select the **New** button on the top right-hand corner of the library view. This will open the Conditional Modifier Model view. To View or Edit a Conditional Modifier Model, select the **Edit** button in the Action column. You can input the following properties for the Conditional Modifier Model.

Property	Description
Type	This should default to Conditional Modifier. If you prefer a different type, select from drop down.
Name	This can be entered as text.

You can input the following properties for the Conditional Modifier Model in the Assumptions section.

Property	Description
Assumed Probability	Enter this value as a decimal.
Assumption	This can be entered as text.
Comment	This can be entered as text.
Sources	This can be entered as text.
Citation	Citations can be added to the Citations Library and associated with a Conditional Modifier Model.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Conditional Modifier Model view shows Conditional Modifiers (count that are using the models).

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

7.7 Conditional Modifiers

The Conditional Modifiers library allows for creation and configuration of individual Conditional Modifiers that can be associated with Hazard Scenarios.

Select the ***Conditional Modifiers*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Assumed Probability
- Model
- Labels
- Action

To create a new Conditional Modifier, select the **New** button on the top right-hand corner of the library view. This will open the Conditional Modifier view. To View or Edit a Conditional Modifier, select the **Edit** button in the Action column. You can input the following properties for the Conditional Modifier.

Property	Description
Conditional Modifier Model	Conditional Modifier Models can be added to the Conditional Modifier Models Library and associated with a Conditional Modifier.
Name	This can be entered as text.
Description	This can be entered as text.

You can input the following properties for the Conditional Modifier in the Assumptions section. These may be based on the Conditional Modifier Model selected.

Property	Description
Assumed Probability	Enter this value as a decimal.
Assumption	This can be entered as text.
Comment	This can be entered as text.
Sources	This can be entered as text.
Citation	Citations can be added to the Citations Library and associated with a Conditional Modifier.

The Hierarchy section shows all Parents and Children associated with the Conditional Modifier. The Parents section will show associated Hazard Scenarios and Conditional Modifier Models.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Conditional Modifier view shows Hazards and Initiating Events.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

Chapter 8 SIF Safeguards Library

The SIF Safeguards Library section contains the following libraries.

- SIF Safeguard Models
- SIF Safeguards
- Sensor Groups
- Logic Solver Groups
- Final Element Groups

Each will be described in detail in the subsequent sections.

8.1 SIF Safeguard Models

The SIF Safeguard Models library allows for creation and configuration of SIF Safeguard Models to be associated with individual SIF Safeguards.

Select the ***SIF Safeguard Models*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Assumed PFD
- Action

To create a new SIF Safeguard Model, select the **New** button on the top right-hand corner of the library view. This will open the SIF Safeguard Model view. To View or Edit a SIF Safeguard Model, select the **Edit** button in the Action column. You can input the following properties for the SIF Safeguard Model.

Property	Description
Type	This should default to SIF Safeguard. If you prefer a different type, select from drop down.
Name	This can be entered as text.

You can input the following properties for the SIF Safeguard Model in the Assumptions section.

Property	Description
Assumed PFD	Enter this value as a decimal.
Assumed RRF	Enter this value as a whole number.
Assumption	This can be entered as text.
Comment	This can be entered as text.
Sources	This can be entered as text.
Citation	Citations can be added to the Citations Library and associated with a SIF Safeguard Model.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the SIF Safeguard Model view shows SIFs (count using the model), Demands, Failures, Actual PFD, and Actual Risk Reduction.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

8.2 SIF Safeguards

The SIF Safeguards library allows for creation and configuration of individual SIF Safeguards that can be associated with Sensor Groups, Logic Solvers, Final Element Groups, Tags, and Devices.

Select the ***SIF Safeguards*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Model
- Labels
- Action

To create a new SIF Safeguard, select the **New** button on the top right-hand corner of the library view. This will open the SIF Safeguard view. To View or Edit a SIF Safeguard, select the **Edit** button in the Action column. You can input the following properties for the SIF Safeguard.

Property	Description
Model	This will default to 'SIF – SIL 1'. Model can be changed by selecting the model to open the Models view on the right-side panel. Select the new Model and close the view.
Name	This can be entered as text.
Description	This can be entered as text.
Tag	This can be entered as text.
Comment	This can be entered as text.
Safeguard Category	Safeguard Categories can be configured in SILstat Settings and associated with an SIF Safeguard.
Immediate Consequence	This can be entered as text.
Potential Ultimate Consequence	This can be entered as text.

You can input the following properties for the SIF Safeguard in the LOPA Data section.

Property	Description
Assumed PFD	Enter this value as a decimal.
Assumed RRF	Enter this value as a whole number.
Assumed Demand Rate	Enter the value in frequency per year.
Assumption	This can be entered as text.
Comment	This can be entered as text.
Sources	This can be entered as text.
Citation	Citations can be added to the Citations Library and associated with an Initiating Event Model.

You can input the following properties for the SIF Safeguard in the SILver Data section.

Property	Description
Achieved SIL	Select SIL Level from drop down.
Achieved RRF	Enter this value as a whole number.
SIF Mission Time	Enter the value in years.
Start-up Time	Enter the value in hours.

Once the SIF Safeguard is defined a SIF Diagram will appear. This allows you to associate existing items from the library or create new items. Items that can be associated with a SIF Safeguard include:

- Sensor Groups
- Logic Solver
- Final Element Groups

By default, the SIF Safeguard will have 1 Sensor Group, 1 Logic Solver, and 1 Final Element Group. Below the SIF Diagram you can specify:

- Vote between Sensor Groups
- Vote between Final Element Groups

You can create new items via the diagram, or by selecting the **New** button and choosing the item type from the drop down. This will show a new view for the item to be defined. After specifying the new item, select **Create**. Upon creation the item will be associated with the SIF Safeguard.

To add existing items to the SIF Safeguard, select the **Associate** button and choose the item type from the drop down. A panel will appear on the right-hand side showing existing items in the database. For each item the Name, Type, and Action are shown. To add this to the SIF Safeguard, select the toggle button under the Action column. This will toggle from *Off* to *On*. Once all items to be associated are switched to *On*, close the right-hand panel. Please Note: once the safeguard is in operation, you will not be able to disassociate items.

The SIF Diagram can be viewed in Fullscreen. Selecting items in the Diagram will show associated data.

The Hierarchy section shows all Parents and Children associated with the SIF Safeguard. Parents will include Areas, Hazards, and Initiating Events the SIF Safeguard is associated with. Children will show the Sensor, Logic Solver, and Final Element Groups. Through the hierarchy you can directly edit, create new, and associate any existing children.

The Procedures section shows any procedures that have been assigned or inherited. Procedures can be added to the Procedures Library and associated with the SIF Safeguard. The Procedures section shows the following properties:

- Name
- Interval
- Duration
- Initial Run

The Inherited Procedures section shows procedures assigned to a Parent associated with the SIF Safeguard. These are read-only on the child level. To edit these procedures, you must navigate to the Parent.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the SIF Safeguard view shows Hazards, Initiating Events, Demands, and Failures.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

8.3 Sensor Groups

The Sensor Groups library allows for creation and configuration of individual Sensor Groups to be associated with SIF Safeguards.

Select the ***Sensor Groups*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Action

To create a new Sensor Group, select the **New** button on the top right-hand corner of the library view. This will open the Sensor Group view. To View or Edit a Sensor Group, select the **Edit** button in the Action column. You can input the following properties for the Sensor Group.

Property	Description
Name	This can be entered as text.
Description	This can be entered as text.
Type	Types include Sensor, Logic Solver and Final Element. This field will default to 'Sensor' if added to the Sensor Group Library.

The Hierarchy section shows all Parents and Children associated with the Sensor Group. Parents include Hazards, Initiating Events, and SIF Safeguards. Since Sensor Groups can belong to multiple Parents, it will be listed in grid format. Within the grid, select the Parents links to view the Parent. Children will show associated Sensor Tags. You can add New, Associate, and Disassociate the Tags.

You can input the following properties for the Sensor Group in the SILver Data, Group Options section.

Property	Description
Vote between Tags	Enter vote between the Tags or Legs of the Sensor Group in MooN format.
Diverse	Toggle On to indicate if Sensor devices are diverse or Off to indicate if Sensor devices are identical.
Beta Factor	Enter the value as a percentage.
Mean Repair Time	Enter the value in hours.
Group Mission Time	Enter the value in years.

You can input the following properties for the Sensor Group in the SILver Data, Analysis Proof Test Configurations section.

Property	Description
Interval	Enter the value in years.
Total Duration	Enter the value in minutes.

You can input the following properties for the Sensor Group in the SILver Data, Application Level Diagnostic Test section.

Property	Description
On/Off	Toggle from Off to On to enter information on Application Level Diagnostic Test.
Interval	Enter the value in years.
Total Duration	Enter the value in minutes.

The Procedures section shows any procedures that have been assigned or inherited. Procedures can be added to the Procedures Library and associated with the Sensor Group. The Procedures section shows the following properties:

- Name
- Interval
- Duration
- Initial Run

The Inherited Procedures section shows procedures assigned to a Parent associated with the Sensor Group. These are read-only on the child level. To edit these procedures, you must navigate to the Parent.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Sensor Group view shows SIF Safeguards, Tags, Procedures, Operating Hours, Demands, and Failures.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

8.4 Logic Solver Groups

The Logic Solver Groups library allows for creation and configuration of individual Logic Solver Groups to be associated with SIF Safeguards.

Select the ***Logic Solver Groups*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Action

To create a new Logic Solver Group, select the **New** button on the top right-hand corner of the library view. This will open the Logic Solver Group view. To View or Edit a Logic Solver Group, select the **Edit** button in the Action column. You can input the following properties for the Logic Solver Group.

Property	Description
Name	This can be entered as text.
Description	This can be entered as text.
Type	Types include Sensor, Logic Solver and Final Element. This field will default to 'Logic Solver' if added to the Logic Solver Group Library.

The Hierarchy section shows all Parents and Children associated with the Logic Solver Group. Parents include Hazards, Initiating Events, and SIF Safeguards. Since Logic Solver Groups can belong to multiple Parents, it will be listed in grid format. Within the grid, select the Parents links to view the Parent. Children will show the Logic Solver Tag. You can add New, Associate, and Disassociate the Tag.

You can input the following properties for the Logic Solver Group in the SILver Data, Group Options section.

Property	Description
Mean Repair Time	Enter the value in hours.
Group Mission Time	Enter the value in years.

You can input the following properties for the Logic Solver Group in the SILver Data, Analysis Proof Test Configurations section.

Property	Description
Interval	Enter the value in years.
Total Duration	Enter the value in minutes.

You can input the following properties for the Logic Solver Group in the SILver Data, Application Level Diagnostic Test section.

Property	Description
On/Off	Toggle from Off to On to enter information on Application Level Diagnostic Test.
Interval	Enter the value in years.
Total Duration	Enter the value in minutes.

You can input the following properties for the Logic Solver Group in the SILver Data, Input Output section.

Property	Description
Sensor Part Vote	Enter vote between the Sensor Groups in MooN format.
Final Element Part Vote	Enter vote between the Final Element Groups in MooN format.

The Procedures section shows any procedures that have been assigned or inherited. Procedures can be added to the Procedures Library and associated with the Logic Solver Group. The Procedures section shows the following properties:

- Name
- Interval
- Duration
- Initial Run

The Inherited Procedures section shows procedures assigned to a Parent associated with the Logic Solver Group. These are read-only on the child level. To edit these procedures, you must navigate to the Parent.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Logic Solver Group view shows SIF Safeguards, Tags, Procedures, Operating Hours, Demands, and Failures.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

8.5 Final Element Groups

The Final Element Groups library allows for creation and configuration of individual Final Element Groups to be associated with SIF Safeguards.

Select the ***Final Element Groups*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Action

To create a new Final Element Group, select the **New** button on the top right-hand corner of the library view. This will open the Final Element Group view. To View or Edit a Final Element Group, select the **Edit** button in the Action column. You can input the following properties for the Final Element Group.

Property	Description
Name	This can be entered as text.
Description	This can be entered as text.
Type	Types include Sensor, Logic Solver and Final Element. This field will default to 'Final Element' if added to the Final Element Group Library.

The Hierarchy section shows all Parents and Children associated with the Final Element Group. Parents include Hazards, Initiating Events, and SIF Safeguards. Since Final Element Groups can belong to multiple Parents, it will be listed in grid format. Within the grid, select the Parents links to view the Parent. Children will show associated Final Element Tags. You can add New, Associate, and Disassociate the Tags.

You can input the following properties for the Final Element Group in the SILver Data, Group Options section.

Property	Description
Vote between Tags	Enter vote between the Tags or Legs of the Final Element Group in MooN format.
Diverse	Toggle On to indicate if Final Element devices are diverse or Off to indicate if Final Element devices are identical.
Beta Factor	Enter the value as a percentage.
Mean Repair Time	Enter the value in hours.
Group Mission Time	Enter the value in years.

You can input the following properties for the Final Element Group in the SILver Data, Analysis Proof Test Configurations section.

Property	Description
Interval	Enter the value in years.
Total Duration	Enter the value in minutes.

You can input the following properties for the Final Element Group in the SILver Data, Partial Valve Stroke Test section.

Property	Description
On/Off	Toggle from Off to On to enter information on Partial Valve Stroke Test.
Interval	Enter the value in years.
Total Duration	Enter the value in minutes.

The Procedures section shows any procedures that have been assigned or inherited. Procedures can be added to the Procedures Library and associated with the Final Element Group. The Procedures section shows the following properties:

- Name
- Interval
- Duration
- Initial Run

The Inherited Procedures section shows procedures assigned to a Parent associated with the Final Element Group. These are read-only on the child level. To edit these procedures, you must navigate to the Parent.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Final Element Group view shows SIF Safeguards, Tags, Procedures, Operating Hours, Demands, and Failures.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

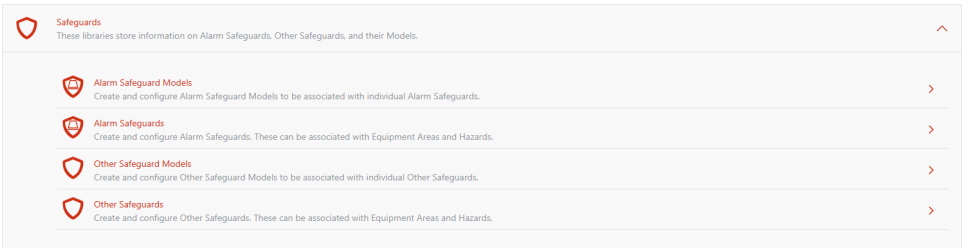
Chapter 9 Safeguards Library

The Safeguards Library section contains the following libraries.

Safeguards Library

- Alarm Safeguard Models
- Alarm Safeguards
- Other Safeguard Models
- Other Safeguards

Each will be described in detail in the subsequent sections.



9.1 Alarm Safeguard Models

The Alarm Safeguard Models library allows for creation and configuration of Alarm Safeguard Models to be associated with individual Alarm Safeguards.

Select the ***Alarm Safeguard Models*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Assumed PFD
- Action

To create a new Alarm Safeguard Model, select the **New** button on the top right-hand corner of the library view. This will open the Alarm Safeguard Model view. To View or Edit an Alarm Safeguard Model, select the **Edit** button in the Action column. You can input the following properties for the Alarm Safeguard Model.

Property	Description
Type	This should default to Alarm Safeguard. If you prefer a different type, select from drop down.
Name	This can be entered as text.

You can input the following properties for the Alarm Safeguard Model in the Assumptions section.

Property	Description
Assumed PFD	Enter this value as a decimal.
Assumed RRF	Enter this value as a whole number.
Assumption	This can be entered as text.
Comment	This can be entered as text.
Sources	This can be entered as text.
Citation	Citations can be added to the Citations Library and associated with an Alarm Safeguard Model.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Alarm Safeguard Model view shows Alarms (count using the model), Demands, Failures, Actual PFD, and Actual Risk Reduction.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

9.2 Alarm Safeguards

The Alarm Safeguards library allows for creation and configuration of individual Alarm Safeguards that can be associated with Hazard Scenarios and Initiating Events.

Select the ***Alarm Safeguards*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Model
- Labels
- Action

To create a new Alarm Safeguard, select the **New** button on the top right-hand corner of the library view. This will open the Alarm Safeguard view. To View or Edit an Alarm Safeguard, select the **Edit** button in the Action column. You can input the following properties for the Alarm Safeguard.

Property	Description
Model	This will default to 'Alarm Layer of Protection – Human Response to abnormal conditions'. The Model can be changed by selecting the model to open the Models view on the right-side panel. Select the new Model and close the view.
Name	This can be entered as text.
Description	This can be entered as text.
Comment	This can be entered as text.
Tag	Tags can be created in the Tag library and associated with the Alarm Safeguard using the drop-down menu.
Safeguard Category	Safeguard Categories can be configured in SILstat Settings and associated with an Alarm Safeguard.
Immediate Consequence	This can be entered as text.
Potential Ultimate Consequence	This can be entered as text.

You can input the following properties for the Alarm Safeguard in the LOPA Data section.

Property	Description
Assumed PFD	Enter this value as a decimal.
Assumed RRF	Enter this value as a whole number.
Assumed Demand Rate	Enter the value in frequency per year.
Assumption	This can be entered as text.
Comment	This can be entered as text.
Sources	This can be entered as text.
Citation	Citations can be added to the Citations Library and associated with a Conditional Modifier.

The Custom Data section shows fields defined by the user and associated with Alarm Safeguards.

The Hierarchy section shows all Parents and Children associated with the Alarm Safeguard. Parents will include Areas, Hazards, and Initiating Events the Alarm Safeguard is associated with. Children include associated Tags.

The Procedures section shows any procedures that have been assigned or inherited. Procedures can be added to the Procedures Library and associated with the Alarm Safeguard. The Procedures section shows the following properties:

- Name
- Interval
- Duration
- Initial Run

The Inherited Procedures section shows procedures assigned to a Parent associated with the Alarm Safeguard. These are read-only on the child level. To edit these procedures, you must navigate to the Parent.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Alarm Safeguard view shows Demands, Failures, Actual PFD, and Actual Risk Reduction.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

9.3 Other Safeguard Models

The Other Safeguard Models library allows for creation and configuration of Other Safeguard Models to be associated with individual Other Safeguards.

Select the ***Other Safeguard Models*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Assumed PFD
- Action

To create a new Other Safeguard Model, select the **New** button on the top right-hand corner of the library view. This will open the Other Safeguard Model view. To View or Edit an Other Safeguard Model, select the **Edit** button in the Action column. You can input the following properties for the Other Safeguard Model.

Property	Description
Type	This should default to Other Safeguard. If you prefer a different type, select from drop down.
Name	This can be entered as text.

You can input the following properties for the Other Safeguard Model in the Assumptions section.

Property	Description
Assumed PFD	Enter this value as a decimal.
Assumed RRF	Enter this value as a whole number.
Assumption	This can be entered as text.
Comment	This can be entered as text.
Sources	This can be entered as text.
Citation	Citations can be added to the Citations Library and associated with an Other Safeguard Model.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Other Safeguard Model view shows Other Safeguards (count that are using the model), Demands, Failures, Actual PFD, and Actual Risk Reduction.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

9.4 Other Safeguards

The Other Safeguards library allows for creation and configuration of individual Other Safeguards that can be associated with Hazard Scenarios and Initiating Events.

Select the ***Other Safeguards*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Model
- Labels
- Action

To create a new Other Safeguard, select the **New** button on the top right-hand corner of the library view. This will open the Other Safeguard view. To View or Edit an Other Safeguard, select the **Edit** button in the Action column. You can input the following properties for the Other Safeguard.

Property	Description
Model	The Model can be changed by selecting the model to open the Models view on the right-side panel. Select the new Model and close the view.
Name	This can be entered as text.
Description	This can be entered as text.
Comment	This can be entered as text.
Tag	Tags can be created in the Tag library and associated with the Safeguard using the drop-down menu.
Safeguard Category	Safeguard Categories can be configured in SILstat Settings and associated with a Safeguard.
Immediate Consequence	This can be entered as text.
Potential Ultimate Consequence	This can be entered as text.

You can input the following properties for the Other Safeguard in the LOPA Data section.

Property	Description
Assumed PFD	Enter this value as a decimal.

Property	Description
Assumed RRF	Enter this value as a whole number.
Assumed Demand Rate	Enter the value in frequency per year.
Assumption	This can be entered as text.
Comment	This can be entered as text.
Sources	This can be entered as text.
Citation	Citations can be added to the Citations Library and associated with a Conditional Modifier.

The Custom Data section shows fields defined by the user and associated with Other Safeguards.

The Hierarchy section shows all Parents and Children associated with the Other Safeguard. Parents will include Areas, Hazards, and Initiating Events the Other Safeguard is associated with. Children include associated Tags.

The Procedures section shows any procedures that have been assigned or inherited. Procedures can be added to the Procedures Library and associated with the Other Safeguard. The Procedures section shows the following properties:

- Name
- Interval
- Duration
- Initial Run

The Inherited Procedures section shows procedures assigned to a Parent associated with the Other Safeguard. These are read-only on the child level. To edit these procedures, you must navigate to the Parent.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Other Safeguard view shows Demands, Failures, Actual PFD, and Actual Risk Reduction.

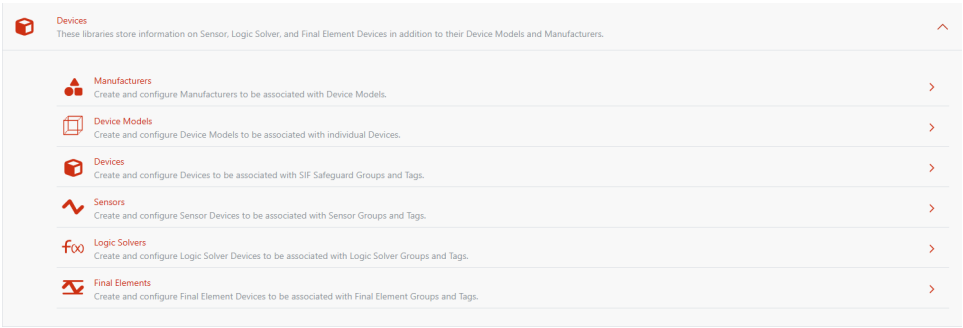
To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

Chapter 10 Devices Library

The Devices Library section contains the following libraries.

- Manufacturers
- Device Models
- Devices
- Sensors
- Logic Solvers
- Final Elements

Each will be described in detail in the subsequent sections.



10.1 Manufacturers

The Manufacturers library allows for creation and configuration of Manufacturers to be associated with Device Models.

Select the ***Manufacturers*** library to view all Manufacturers in the database. A grid shows the following properties for each.

- Logo
- Name
- Action

To create a new Manufacturer, select the **New** button on the top right-hand corner of the library view. This will open the Manufacturer view. To View or Edit a Manufacturer, select the **Edit** button in the Action column. You can input the following properties for the Manufacturer.

Property	Description
Name	This can be entered as text.
Description	This can be entered as text.
Logo	Logos can be added to the Resources Library and associated with a Manufacturer.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Manufacturers view shows Number of Device Models and the number of Devices that are using the Manufacturer.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

10.2 Device Models

The Device Models library allows for creation and configuration of Device Models to be associated with individual Devices.

Select the ***Device Models*** library to view all Device Models in the database. A grid shows the following properties for each.

- Device Type
- Name
- Manufacturer
- Labels
- Action

To create a new Device Model, select the **New** button on the top right-hand corner of the library view. This will open the Device Model view. To View or Edit a Device Model, select the **Edit** button in the Action column. You can input the following properties for the Device Model.

Property	Description
Name	This can be entered as text.
Description	This can be entered as text.
Model	This can be entered as text.
Comments	This can be entered as text.
Device Type	Device Types can be configured in SILstat Settings and associated with Device Models by selecting from the drop-down list.
Measurement Type	If the Device Type selected is a Sensor, you must choose a Measurement Type from the drop-down. Options include: None, Pressure, FireGas, Proximity, Flow, Temperature, Level, Other.
Manufacturer	Manufacturers can be added to the Manufacturers library and associated with Device Models by selecting from the drop-down list.
Citations	Citations can be added to the Citations Library and associated with a Device Model.

You can input the following properties for the Device Model in the Operations section. This information is optional.

Property	Description
Certified SIL	Select SIL Level from the drop-down list. Options include 0, 1, 1-2, 2, 2-3, or 3.
Architecture	Select Architecture Type from the drop-down list. Options include A or B.
Restrict Trip Direction	Select Trip Direction from drop-down list. Options include High or Low.
Response Time	Enter in milliseconds or adjust units before entering.
Maximum Diagnostic Interval	Enter in minutes or adjust units before entering.
Useful Life	Enter in years or adjust units before entering.
Useful Cycles	Enter number of cycles.

In the channels section, the input and output interfaces for the Device Model can be set. The following list shows all options.

- Any
- Analog In
- Analog Out
- Digital In
- Digital Out
- Hydraulic In
- Hydraulic Out
- Pneumatic In
- Pneumatic Out
- Thermocouple
- RTD 3 Wire
- RTD 4 Wire
- Process
- Mechanical
- Fiber Optic
- Pass Through

You can input the following properties for the Device Model in the Failure Rate section.

Property	Description
Fail Low Failure Rate	Enter failure rate in failures per hour.
Fail High Failure Rate	Enter failure rate in failures per hour.
Fail Detected Failure Rate	Enter failure rate in failures per hour.
Dangerous Detected Failure Rate	Enter failure rate in failures per hour.
Dangerous Undetected Failure Rate	Enter failure rate in failures per hour.

Property	Description
Safe Detected Failure Rate	Enter failure rate in failures per hour.
Safe Undetected Failure Rate	Enter failure rate in failures per hour.
Annunciation Detected Failure Rate	Enter failure rate in failures per hour.
Annunciation Undetected Failure Rate	Enter failure rate in failures per hour.
No Effect Failure Rate	Enter failure rate in failures per hour.
External Leakage Failure Rate	Enter failure rate in failures per hour.
Site Safety Index	Choose SSI Level from the drop-down menu. Options includes SSI 0: None, SSI 1: Medium, SSI 2: Good, SSI 3: Almost Perfect, SSI 4: Perfect. The default selection is SSI 2.

Failure Rates can also be entered for the Device Model channels. This is optional.

The Site Safety Index is a qualitative metric meant to capture how well each site performs maintenance tasks. To effectively compare Assumed vs. Actual Failure Rates, the SSI selection should match that used for the SIL Verification calculation in SILver. A more detailed description of each level is listed below.

SSI	Description
SSI 4 - Perfect	Repairs are always completed correctly. Testing is always performed correctly and on schedule; equipment is always replaced before the end of useful life; equipment is always selected according to the specified environmental limits and process-compatible materials; electrical power supplies are clean of transients; isolated, pneumatic supplies and hydraulic fluids are always kept clean.
SSI 3 - Excellent	Repairs are completed correctly. Testing is performed correctly and on schedule. Equipment normally is selected based on the specified environmental limits, and a good analysis of the process chemistry and compatible materials. Electrical power supplies are normally clean of transients and isolated; pneumatic supplies and hydraulic fluids are mostly kept clean.
SSI 2 - Good	Repairs are usually completed correctly. Testing is performed correctly and mostly on schedule. Most equipment is replaced before the end of useful life.
SSI 1 - Medium	Many repairs are completed correctly. Testing is performed, and mostly on schedule, some equipment replaced before end of useful life.
SSI 0 - None	Repairs are not always done. Testing is not performed; equipment is not replaced until failure.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Device Model view shows Demands, Failures, Actual PFD, Actual Risk Reduction Factor, Operating Hours, and Devices.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

10.3 Devices

The Devices library allows for creation and configuration of Devices to be associated with SIF Safeguards, Sensors, Logic Solvers, and Final Elements.

Select the ***Devices*** library to view all Devices in the database. A grid shows the following properties for each.

- Serial Number
- Name
- Status
- Manufacturer
- Model
- Labels
- Action

To create a new Device, select the **New** button on the top right-hand corner of the library view. This will open the Device view. To View or Edit a Device, select the **Edit** button in the Action column. You can input the following properties for the Device.

Property	Description
Manufacturer	Manufacturers can be associated with Device Models. Once the Device's Model is set, the Manufacturer will show here.
Device Model	Device Models can be added to the Device Model library and associated with Devices by selecting from the drop-down list.
Serial Number	This can be entered as text.
Name	This can be entered as text.
Description	This can be entered as text.
Utilization	This can be entered as a percent.
Proven In Use	Proven In Use justifications documented in exSILentia can be imported into SILstat and shown here for each Device.

The Lifecycle Section shows all events associated with the Device.

The Hierarchy section shows all Parents and Children associated with the Device. Parents include Tags associated with SIF Safeguards.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Device view shows Demands, Failures, Actual PFD, Actual Risk Reduction Factor, Operating Hours, and Children.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

10.4 Sensors

The Sensors library allows for creation and configuration of Sensor Devices to be associated with Sensor Groups in SIF Safeguards.

Select the ***Sensors*** library to view all Sensor Devices in the database. A grid shows the following properties for each.

- Serial Number
- Name
- Status
- Manufacturer
- Model
- Labels
- Action

To create a new Sensor Device, select the **New** button on the top right-hand corner of the library view. This will open the Device view. To View or Edit a Sensor Device, select the **Edit** button in the Action column. You can input the following properties for the Device.

Property	Description
Manufacturer	Manufacturers can be associated with Device Models. Once the Device's Model is set, the Manufacturer will show here.
Device Model	Device Models can be added to the Device Model library and associated with Devices by selecting from the drop-down list.
Serial Number	This can be entered as text.
Name	This can be entered as text.
Description	This can be entered as text.
Utilization	This can be entered as a percent.
Proven In Use	Proven In Use justifications documented in exSILentia can be imported into SILstat and shown here for each Device.

The Lifecycle Section shows all events associated with the Device.

The Hierarchy section shows all Parents and Children associated with the Device. Parents include Tags associated with SIF Safeguards.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Sensor Device view shows Demands, Failures, Actual PFD, Actual Risk Reduction Factor, Operating Hours, and Children.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

10.5 Logic Solvers

The Logic Solvers library allows for creation and configuration of Logic Solver Devices to be associated with SIF Safeguards.

Select the ***Logic Solvers*** library to view all Logic Solver Devices in the database. A grid shows the following properties for each.

- Serial Number
- Name
- Status
- Manufacturer
- Model
- Labels
- Action

To create a new Logic Solver Device, select the **New** button on the top right-hand corner of the library view. This will open the Device view. To View or Edit a Logic Solver Device, select the **Edit** button in the Action column. You can input the following properties for the Device.

Property	Description
Manufacturer	Manufacturers can be associated with Device Models. Once the Device's Model is set, the Manufacturer will show here.
Device Model	Device Models can be added to the Device Model library and associated with Devices by selecting from the drop-down list.
Serial Number	This can be entered as text.
Name	This can be entered as text.
Description	This can be entered as text.
Utilization	This can be entered as a percent.
Proven In Use	Proven In Use justifications documented in exSILentia can be imported into SILstat and shown here for each Device.

The Lifecycle Section shows all events associated with the Device.

The Hierarchy section shows all Parents and Children associated with the Device. Parents include Tags associated with SIF Safeguards.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Sensor Device view shows Demands, Failures, Actual PFD, Actual Risk Reduction Factor, Operating Hours, and Children.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

10.6 Final Elements

The Final Elements library allows for creation and configuration of Final Element Devices to be associated with Final Element Groups in SIF Safeguards.

Select the ***Final Elements*** library to view all Final Element Devices in the database. A grid shows the following properties for each.

- Serial Number
- Name
- Status
- Manufacturer
- Model
- Labels
- Action

To create a new Final Element Device, select the **New** button on the top right-hand corner of the library view. This will open the Device view. To View or Edit a Final Element Device, select the **Edit** button in the Action column. You can input the following properties for the Device.

Property	Description
Manufacturer	Manufacturers can be associated with Device Models. Once the Device's Model is set, the Manufacturer will show here.
Device Model	Device Models can be added to the Device Model library and associated with Devices by selecting from the drop-down list.
Serial Number	This can be entered as text.
Name	This can be entered as text.
Description	This can be entered as text.
Utilization	This can be entered as a percent.
Proven In Use	Proven In Use justifications documented in exSILentia can be imported into SILstat and shown here for each Device.

The Lifecycle Section shows all events associated with the Device.

The Hierarchy section shows all Parents and Children associated with the Device. Parents include Tags associated with SIF Safeguards.

The Common Properties section shows all Resources, References and Labels associated with the item.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Sensor Device view shows Demands, Failures, Actual PFD, Actual Risk Reduction Factor, Operating Hours, and Children.

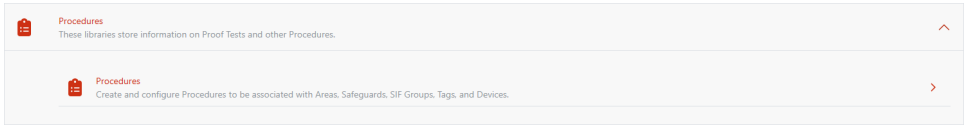
To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

Chapter 11 Procedures Library

The Procedures Library section contains the following libraries.

- Procedures

Each will be described in detail in the subsequent sections.



11.1 Procedures

The Procedures library allows for creation and configuration of Proof Tests and other Procedures to be associated with SIF Safeguards, SIF Groups, Tags, and Areas.

Select the ***Procedures*** library to view all Procedures in the database. A grid shows the following properties for each.

- Type
- Name
- Applies
- Total Duration
- Labels
- Action

To create a new Procedure, select the **New** button on the top right-hand corner of the library view. This will open the Procedure view. To View or Edit a Procedure, select the **Edit** button in the Action column. You can input the following properties for the Procedure.

Property	Description
Type	Select the Procedure type from the drop-down. Options include Proof Test or Procedure.
Name	This can be entered as text.
Description	This can be entered as text.
Default Interval	Enter time interval between proof tests.
Associations	Select from the drop-down where the Procedure applies. Options include: Any, Equipment, SIF Safeguard, Alarm Safeguard, Other Safeguard, SIF Group, Tag / SIF Leg.

The Steps section allows for definition of detailed Procedure Steps. Select the **Add** button to add a step. This will open the Step Editor in the right-side panel.

You can input the following properties for each Step:

Property	Description
Name	This can be entered as text.
Description	This can be entered as text.
Duration (Estimated)	Enter the estimated time it will take to complete this step.

In the Data Collection section, you can specify fields for data entry during this step of the procedure. In some cases, pass/fail criteria can be specified based on the data collected. To enable this function, select the toggle button in the Data Collection section header from 'Off' to 'On'. Then select the 'Input Type' from the drop-down menu. Options for Input Type include Numeric (Range), Boolean (True/False), or Text. This will determine the type of input field associated with the Step.

You can input the following properties for the Data Collection if the Input Type is Numeric (Range).

Property	Description
Name	This can be entered as text.
Expected Value	Enter the value expected when performing the procedure step for the procedure to pass.
Tolerance	Enter the tolerance allowed for the procedure to pass.
Unit of Measure	Enter a pre-defined Unit of Measure from the library or create a new Unit of Measure.

You can input the following properties for the Data Collection if the Input Type is Boolean (True/False).

Property	Description
Name	This can be entered as text.
Expected Value	Use the toggle button to indicate if the expected answer is 'True' or 'False' when performing the procedure step for the procedure to pass.

You can input the following properties for the Data Collection if the Input Type is Text.

Property	Description
Name	This can be entered as text.
Expected Value	Use the toggle button to indicate if the expected answer is 'True' or 'False' when performing the procedure step for the procedure to pass.

The Bypass Section allows you to indicate if a Bypass is added or removed during this step. To enable this function, select the toggle button to 'On'.

The Step Editor includes a 'Step' section that allows you to define sub-steps. This works the same as the initial step definition, but in this case, it creates a Child Step.

The Common Properties section shows all Resources, References and Labels associated with the Step.

To create a the Step, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

Once a step is created, the Step Editor will close and show the Procedure view. You will see the newly defined Step in the Step section. You can continue to add Steps and sub-steps until the Procedure is completed.

The Common Properties section shows all Resources, References and Labels associated with the Procedure.

To create the Procedure, select the 'Create' button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights on the Procedure view shows Average Interval, Average Duration, Average Time Overdue, and Pass Rate.

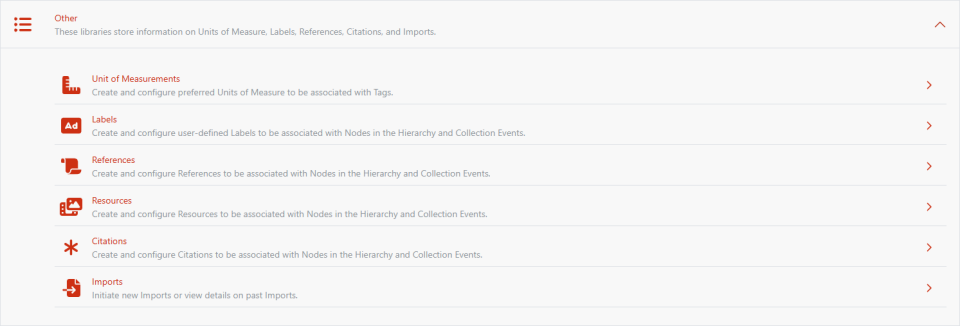
To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

Chapter 12 Other Library

The Other Library section contains the following libraries.

- Units of Measurement
- Labels
- References
- Resources
- Citations
- Imports

Each will be described in detail in the subsequent sections.



12.1 Units of Measurement

The Units of Measurement library allows for creation and configuration of Units of Measurement to be associated with Tags and Procedure data collection steps.

Select the ***Units of Measurement*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Display Label
- Unit of Measurement
- Action

To create a new Unit of Measurement, select the **New** button on the top right-hand corner of the library view. This will open the Unit of Measurement view. To View or Edit a Unit of Measurement, select the **Edit** button in the Action column. You can input the following properties for the Unit of Measurement.

Property	Description
Name	This can be entered as text.
Description	This can be entered as text.
Comment	This can be entered as text.
Display the Input in Scientific Notation	Toggle from Off to On if you'd like values input to be displayed in scientific notation.
SI Metric Order of Magnitude	Select option from the drop-down menu as applicable.
US Customary Order of Magnitude	Select option from the drop-down menu as applicable.
Simple Display Label	Toggle from Off to On to allow the unit of measurement to be set to a specific display label that does not change. Enter label as text.
Advanced Unit of Measurement	Toggle from Off to Onto use a well-defined unit of measurement with built in localization support to automatically adapt to user system of measurement preferences. Select Unit of Measurement from the drop-down menu.

The preview section shows how the Unit of Measurement will be displayed for SI Metric Units and USA Customary Units.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

12.2 Labels

The Labels library allows for creation and configuration of Labels to be associated with any item in the database.

Select the ***Labels*** library to view all items in the database. A grid shows the following properties for each.

- Name
- Color
- Action

To create a new Label, select the **New** button on the top right-hand corner of the library view. This will open the Label view. To View or Edit a Label, select the **Edit** button in the Action column. You can input the following properties for the Label.

Property	Description
Name	This can be entered as text.
Description	This can be entered as text.
Fill Pattern	Choose a Pattern Option from the drop-down menu.

Property	Description
Color	Select the Color Tile to open the color picker. Select the color or enter the R, G, B values. If you change a fill pattern that requires more than one color, a secondary color option is available for you to choose. If the colors chosen have a poor contrast ratio, a tip will appear that explains that the colors chosen may be hard to see.
Preview	Shows a preview of the label created.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights display the number of entities that are using the Label.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

12.3 References

The References library allows for creation and configuration of References to be associated with any item in the database.

Select the ***References*** library to view all items in the database. A grid shows the following properties for each.

- Document Number
- Name
- Revision
- Date Modified
- Type
- Action

To create a new Reference, select the **New** button on the top right-hand corner of the library view. This will open the Reference view. To View or Edit a Reference, select the **Edit** button in the Action column. You can input the following properties for the Reference.

Property	Description
Document Number	This can be entered as text.
Name	This can be entered as text.
Description	This can be entered as text.
Comment	This can be entered as text.
Type	Select the Reference Type from the drop-down menu. Reference Types can be configured in the SILstat Settings.
Enable Automatic Revisioning	Toggle from 'Off' to 'On' to automatically track revisions every time a new file is uploaded. This will be set to 'Off' by default.
Revision	If Tracking revisions manually, enter Reference Revision here.
Revision Date	Enter date of Reference Revision.
Resources	Resources can be added to the Resources library and associated with the Reference.
Citation	Citations can be added to the Citation library and associated with the Reference.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights display the number of entities that are using the Reference.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

12.4 Resources

The Resources library allows for creation and configuration of Resources to be associated with any item in the database. These are documents, videos, images, and other media files.

Select the ***Resources*** library to view all items in the database. A grid shows the following properties for each.

- Preview
- Identifier
- Name
- Revision
- Date Modified
- Action

To create a new Resource, select the **New** button on the top right-hand corner of the library view. This will open the Resource view. To View or Edit a Resource, select the **Edit** button in the Action column. You can input the following properties for the Resource.

Property	Description
Identifier	This can be entered as text.
Name	This can be entered as text.

Property	Description
Description	This can be entered as text.
Enable Automatic Revisioning	Toggle from 'Off' to 'On' to automatically track revisions every time a new file is uploaded. This will be set to 'Off' by default.
Revision	If Tracking revisions manually, enter Reference Revision here.
Revision Date	Enter date of Reference Revision.
Resources	Select 'Choose File' to browse for a file and upload as the Resource. This Section also includes options to 'View Resource' and 'Download Resource'.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights display the number of entities that are using the Resource.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

12.5 Citations

The Citations library allows for creation and configuration of Citations to be associated with any item in the database.

Select the ***Citations*** library to view all items in the database. A grid shows the following properties for each.

- Title
- Published
- Authors
- Publisher
- Type
- External Source
- Action

To create a new Citation, select the **New** button on the top right-hand corner of the library view. This will open the Citation view. To View or Edit a Citation, select the **Edit** button in the Action column. You can input the following properties for the Citation.

Property	Description
Type	Select the Type from the drop-down.
Title	This can be entered as text.
Published	Enter date of publication. Select 'Year only' option to enter year of publication only.
Authors	Select **New** to add an Author to the Authors grid. Enter the Author's Last, Middle and First Name.
Publisher	This can be entered as text.
City	This can be entered as text.
Country or Region	This can be entered as text.
DOI	Enter the DOI for the Citation.
URL	Enter the URL for the Citation.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights display the number of entities that are using the Citation.

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

12.6 Imports

The Imports library shows a record of Imports into the database.

Select the ***Imports*** library to view all Imports in the database. A grid shows the following properties for each.

- Name
- State
- Action

To create a new Import, select the **New** button on the top right-hand corner of the library view. This will open the Import view. To View an Import, select the **Edit** button in the Action column. You can input the following properties for the Import.

Property	Description
Name	This can be entered as text.
Description	This can be entered as text.
Import	Select the 'Choose File' button to browse for the file to be imported, or select a Resource from the Resource library to import. In both cases only exSILentia files (.exp) can be selected.
Import Setting – Import Append	Toggle this option from 'Off' to 'On' to ensure if an existing entity in SILstat matches one in the import, it will not be overwritten, and the import will continue. This option is set to 'Off' by default, so if an existing entity in SILstat matched one in the import, the import will fail.

Property	Description
Import Setting – Auto generate Placeholder Hierarchy	Toggle this option from 'Off' to 'On' to automatically create key hierarchy nodes that are not present in the import.
Confirm	Review Name, Description, Import File, and settings selected before Import. Select 'Import' to proceed.
Results	Once Import is complete the Results section show a list of Entities imported, their Count, and their Status. This will indicate if any errors occurred.

To create a new item, select the **Create** button in the top right-hand corner. Items that are not created will be saved as a draft.

The Insights display the Total Duration, State, Created, and Same (number of existing items re-imported).

To delete the item, select the **Delete** button in the top right-hand corner. After deleting the item, it becomes a *soft delete*. A *soft delete* means the item can be recovered with the help of exida for a period of 180 days. After that period is over, the item will become permanently deleted.

Part 3

Configuration

Chapter 13 Configuration

Your site hierarchy can be configured in SILstat's Configuration section. The hierarchy can be created upon import of your exSILentia project files or built directly within SILstat. Here, the hierarchy between Areas, Process Areas, Units, Equipment, Hazard Scenarios, Safeguards, Tags, and Procedures can be defined. This hierarchy has four different views :

1. Physical
2. Hazards
3. Safeguards
4. Procedures

Hierarchies can be completed in any order, though the order listed above gives you the most complete information as you move through the workflows.

After clicking into Configuration, if you have not previously chosen an initial Hierarchy, SILstat will prompt you to choose between the Hierarchy views.

To control the hierarchy view, select the << button to expand and collapse the hierarchy panel. Select the two horizontal bars to expand the panel vertically or horizontally.

Above the hierarchy is a dedicated Search function, which searches items in the Configurations. The Sort function allows you to sort items in the hierarchy alphabetically.

The next button shows which hierarchy view is selected and allows you to switch between views. When you switch views, your place in the previous view is saved for a time. If you select a new view, you will start at the top of the hierarchy.

13.1 Hierarchies

13.1.1 Physical

The Physical hierarchy view represents the location of each Area, Process Area, Unit, Equipment, Tag and Device onsite.

13.1.2 Hazards

The Hazards hierarchy view groups items associated with a Hazard Scenario together, showing Initiating Events, Modifiers, and all Safeguards as children of a Hazard Scenario. If an Initiating Event, Modifier, or Safeguard is re-used across multiple Hazard Scenarios, it will be listed for each Hazard in the Hazards hierarchy view. The link symbol next to the name signifies that it has been reused/linked/associated in multiple areas.

13.1.3 Safeguards

The Safeguard hierarchy view groups items within a Safeguard together, showing the logical relationship between Tags. You will see the Area, Process Area, Unit, Equipment, and all Safeguards including SIFs, Alarms, Relief Devices, etc. Expanding the SIF Safeguards shows the Sensor, Logic Solver, and Final Element parts. If a Tag or Device is re-used across multiple SIFs, it will be listed for each SIF Safeguard in the Safeguard hierarchy view. The link symbol next to the name signifies that it has been reused/linked/associated in multiple areas.

13.1.4 Procedures

The Procedures hierarchy view shows proof tests and procedures assigned throughout your site hierarchy. Depending on their scope, Procedures can be assigned to Units , Equipment, Safeguards, and Tags. If a Procedures is assigned to multiple Areas, it will be listed for each one. Selecting a Procedure will show you the instance of the Procedure applied to that specific part of the hierarchy.

Please Note: When building your hierarchies, you should remember that everything will be defaulted to a draft until you press ***Create***.

13.2 Building a Physical Hierarchy

This section describes how a Physical Hierarchy can be build withing SILstat. As you create new entities, i.e. an area, a tag, etc. you should remember that every new item will be defaulted to a draft until you press "Create".

13.2.1 Creating an Area

To create an Area:

- Go to Library, select ‘Area’, then ‘New’.
- Select an Area Type from the drop-down list.
- Add an Area Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Area.

Another way to create an Area is to go to Configuration and Create a New Area. Create your high-level hierarchy with options for user-defined Areas, Process Areas, Units, and Equipment.

13.2.2 Creating a Unit Node

To create a Unit Node:

- Select the Physical hierarchy view on the left-side panel.
- Navigate to an ‘Area’ node in the hierarchy. Right click to see ‘New’ and ‘Associate’ buttons appear.
- Select ‘New’ or use the drop-down menu and select ‘Unit’. This will open a ‘Unit’ view on the right-hand side of the app.
- Enter a Unit Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Unit node.

An alternate option is to create a Unit Node from the Area:

- Select the Area.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select ‘New’ to create a new Unit node. You will be automatically loaded into the Unit creation page.
- Enter a Unit Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Unit.

13.2.3 Creating an Equipment Node

To create an Equipment Node:

- Select the Physical hierarchy view on the left-side panel.
- Navigate to an ‘Area’ node in the hierarchy. Right click to see ‘New’ and ‘Associate’ buttons appear.
- Select ‘New’ or use the drop-down menu and select ‘Equipment’. This will open an ‘Equipment’ view on the right-hand side of the app.
- Enter an Equipment Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Equipment.

An alternate option is to create an Equipment Node from the Area:

- Select the Area.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select ‘New’ to create a new Equipment node. You will be automatically loaded into the Equipment creation page.
- Enter a Equipment Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Equipment.

A second alternate option is to create an Equipment Node from the Unit Node:

- Select the Physical hierarchy view on the left-side panel.
- Navigate to a ‘Unit’ node in the hierarchy. Right click to see ‘Equipment and ‘Associate’ buttons appear.
- Select ‘Equipment’. This will open an ‘Equipment’ view on the right-hand side of the app.
- Enter an Equipment Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Equipment.

13.2.4 Creating Tags

To create Tags from an Area Node:

- Navigate to an ‘Area’ node in the hierarchy.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Under ‘Tags’, select ‘New’.
- Enter a Tag Name and Description.
- Select the ‘Create’ button to create the Tag.

An alternate option is to create a Tag from a Unit Node.

- Navigate to a ‘Unit’ node in the hierarchy.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Under ‘Tags’, select ‘New’.
- Enter a Tag Name and Description.
- Select the ‘Create’ button to create the Tag.

A second alternate option is to create a Tag from an Equipment Node.

- Navigate to an ‘Equipment’ node in the hierarchy.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Under ‘Tags’, select ‘New’.
- Enter a Tag Name and Description.
- Select the ‘Create’ button to create the Tag.

Currently, there is no limit on how many tags you can create.

To assigning a Device with a Tag:

- Navigate to a Tag.
- Underneath the Name and Description, a Search bar allows you to find a device to associate.

Note: Tags without a Parent cannot be associated with Devices.

13.3 Building a Hazards Hierarchy

This section describes how a Hazard Hierarchy can be build withing SILstat. As you create new entities, i.e. an area, a hazard, etc. you should remember that every new item will be defaulted to a draft until you press "Create".

13.3.1 Creating an Area

To create an Area:

- Go to Library, select ‘Area’, then ‘New’.
- Select an Area Type from the drop-down list.
- Add an Area Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Area.

Another way to create an Area is to go to Configuration and Create a New Area. Create your high-level hierarchy with options for user-defined Areas, Process Areas, Units, and Equipment. Before a Hazard can be created, an Equipment node must first be created.

13.3.2 Creating a Unit Node

To create a Unit Node:

- Select the Hazards hierarchy view on the left-side panel.
- Navigate to an ‘Area’ node in the hierarchy. Right click to see ‘New’ and ‘Associate’ buttons appear.
- Select ‘New’ or use the drop-down menu and select ‘Unit’. This will open a ‘Unit’ view on the right-hand side of the app.
- Enter a Unit Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Unit node.

An alternate option is to create a Unit Node from the Area:

- Select the Area.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select ‘New’ to create a new Unit node. You will be automatically loaded into the Unit creation page.
- Enter a Unit Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Unit.

13.3.3 Creating an Equipment Node

To create an Equipment Node:

- Select the Hazards hierarchy view on the left-side panel.
- Navigate to an ‘Area’ node in the hierarchy. Right click to see ‘New’ and ‘Associate’ buttons appear.
- Select ‘New’ or use the drop-down menu and select ‘Equipment’. This will open an ‘Equipment’ view on the right-hand side of the app.
- Enter an Equipment Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Equipment.

An alternate option is to create an Equipment Node from the Area:

- Select the Area.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select ‘New’ to create a new Equipment node. You will be automatically loaded into the Equipment creation page.
- Enter an Equipment Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Equipment.

A second alternate option is to create an Equipment Node from the Unit Node:

- Select the Physical hierarchy view on the left-side panel.
- Navigate to a ‘Unit’ node in the hierarchy. Right click to see ‘Equipment and ‘Associate’ buttons appear.
- Select ‘Equipment’. This will open an ‘Equipment’ view on the right-hand side of the app.
- Enter an Equipment Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Equipment.

13.3.4 Creating a Hazard

To create a Hazard:

- Select the Hazard hierarchy view on the left-side panel.
- Navigate to an ‘Equipment’ node in the hierarchy. Right click to see ‘New’ and ‘Associate’ buttons appear.
- Select ‘New’ or use the drop-down menu and select ‘Hazard’. This will open a ‘Hazard’ view on the right-hand side of the app.
- Enter a Hazard Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Hazard.

An alternate option is to create a Hazard directly in the ‘Equipment’ view:

- Select the Equipment node. This will open an ‘Equipment’ view on the right-hand side of the app.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select ‘New’ to create a new Hazard. This will open a ‘Hazard’ view on the right-hand side of the app.
- Enter a Hazard Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Hazard.

To associate a Hazard (from the library) in the ‘Equipment’ view:

- Select the Equipment node. This will open an ‘Equipment’ view on the right-hand side of the app.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select ‘Associate’ to choose a Hazard that has been previously created through the Library. This will open the ‘Hazard’ list via a pop-over.
- Use the Toggle Switch on a Hazard to associate it with the Equipment.

13.3.5 Creating an Initiating Event

To create an Initiating Event:

- Navigate to the ‘Hazard’ node in the hierarchy. Right click to see ‘Initiating Event’ and ‘Associate’ buttons appear.
- Select ‘Initiating Event’ to create a new Initiating Event. This will open an ‘Initiating Event’ view on the right-hand side of the app.
- Add the Initiating Event Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Initiating Event.

An alternate option is to create an Initiating Event through the diagram:

- Select the Hazard node. This will open a ‘Hazard’ view on the right-hand side of the app.
- Navigate to the Diagram and select the ‘New’ button and select ‘Initiating Event’ from the drop-down list. This will open an ‘Initiating Event’ view on the right-hand side of the app.
- Add the Initiating Event Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Initiating Event.

To associate an Initiating Event (from the library) in the diagram view:

- Select the Hazard node. This will open a ‘Hazard’ view on the right-hand side of the app.
- Navigate to the Diagram section and select the ‘Associate’ button. Select ‘Initiating Event’ from the drop-down list. This will open an ‘Initiating Event’ view on the right-hand side of the app.
- Select ‘Associate’ to choose an Initiating Event that has been previously created through the Library. This will open the Initiating Event list via a pop-over.
- Use the Toggle Switch on an IE to associate it with the Hazard.

To create an Initiating Event through the hierarchy:

- Select the Hazard node. This will open a ‘Hazard’ view on the right-hand side of the app.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select ‘New’ to create a new Initiating Event. This will open an ‘Initiating Event’ view on the right-hand side of the app.
- Add the Initiating Event Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Initiating Event.

To associate an Initiating Event (from the library) through the hierarchy:

- Select the Hazard node. This will open a ‘Hazard’ view on the right-hand side of the app.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select ‘Associate’ to choose an Initiating Event that has been previously created through the Library. This will open the Initiating Event list via a pop-over.
- Use the Toggle Switch on an IE to associate it with the Hazard.

13.3.6 Creating Safeguards, Enabling Conditions, or Conditional Modifiers

To create new Safeguards, ECs, or CMs:

- Navigate to the ‘Initiating Event’ node in the hierarchy. Right click to see ‘New’ and ‘Associate’ buttons appear.
- Select ‘New’ or the drop-down menu to see options for adding a SIF Safeguard, Alarm Safeguard, Other Safeguard, Enabling Condition, and Conditional Modifier. When users click "New", a SIF Safeguard is the default.
- Selecting a Safeguard or Modifier will open the associated view on the right-hand side of the app.
- Add the Name and Description of the Safeguard or Modifier. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Safeguard or Modifier.

An alternate option is to create Safeguards, ECs, or CMs through the diagram:

- Select the Hazard node. This will open a ‘Hazard’ view on the right-hand side of the app.
- Navigate to the Diagram and select the ‘New’ button to see a drop-down menu to see options for adding a SIF Safeguard, Alarm Safeguard, Other Safeguard, Enabling Condition, and Conditional Modifier.
- This will open a pop-over that requires you to associate an Initiating Event with the Safeguard of Modifier.
- Once associated, you can add the Name and Description of the Safeguard or Modifier. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Safeguard or Modifier.

To associate Safeguards, ECs, or CMs (from the library) in the diagram view:

- Select the Hazard node. This will open a ‘Hazard’ view on the right-hand side of the app.
- Navigate to the Diagram section. Select the ‘Associate’ button to see a drop-down menu of options to associate Safeguards or Modifiers.
- After you make your selection, a pop-over appears where you can use the Toggle Switch on your selection to associate it with the Hazard.

To createSafeguards, ECs, or CMs through the hierarchy:

- Select the Hazard node. This will open a ‘Hazard’ view on the right-hand side of the app.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select the ‘New’ button to see a drop-down menu to see options for adding a SIF Safeguard, Alarm Safeguard, Other Safeguard, Enabling Condition, and Conditional Modifier.
- This will open a pop-over that requires you to associate an Initiating Event.
- Once associated, you can add the Name and Description of the Safeguard or Modifier. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Safeguard or Modifier.

To associate Safeguards, ECs, or CMs (from the library)in the hierarchy:

- Select the Hazard node. This will open a ‘Hazard’ view on the right-hand side of the app.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select ‘Associate’ to choose a Safeguard or Modifier that has been previously created through the Library. This will open the Safeguard or Modifier list via a pop-over.
- Use the Toggle Switch to associate it with the Hazard.

13.3.7 Creating a SIF

To create a new SIF:

Navigate to the ‘Initiating Event’ node in the hierarchy. Right click to see ‘New’ and ‘Associate’ buttons appear.

- Select ‘New’ or the drop-down menu to see options for adding a SIF Safeguard, Alarm Safeguard, Other Safeguard, Enabling Condition, and Conditional Modifier. When users click "New", a SIF Safeguard is the default.
- Selecting a SIF Safeguard will open a ‘Safeguard’ view on the right-hand side of the app.
- Add a Safeguard Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the SIF Safeguard.

Once a SIF is created, the groups (Sensor, Logic Solver, and Final Element) are automatically created, linked, and appear in the tree view. The groups remain in drafts until created.

An alternate option is to create a new SIF Safeguard through the Hazard diagram view:

- Select the Hazard node. This will open a ‘Hazard’ view on the right-hand side of the app.
- Navigate to the Diagram and select the ‘New’ button and select ‘SIF Safeguard’ from the drop-down list. If a SIF Safeguard is chosen, an Initiating Event must also be associated with your SIF.
- Once selected, this will open an ‘SIF Safeguard’ view on the right-hand side of the app.
- Add a Safeguard Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the SIF Safeguard.

To create a SIF through the hierarchy view:

- Select the Hazard node. This will open a ‘Hazard’ view on the right-hand side of the app.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select the ‘New’ button and select ‘SIF Safeguard’ from the drop-down list. If a SIF Safeguard is chosen, an Initiating Event must also be associated with your SIF.
- Once selected, this will open an ‘SIF Safeguard’ view on the right-hand side of the app.
- Add a Safeguard Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the SIF Safeguard.

13.3.8 Adding SIF Groups

Although the SIF groups (Sensor, Logic Solver, and Final Element) are automatically created when a SIF is made, users can manually create/add groups.

To add SIF Groups:

- Navigate to an ‘SIF Safeguard’ node in the hierarchy. Right click to see ‘New’ button appear.
- Select the ‘New’ button and select ‘Sensor Group’ or ‘Final Element Group’ from the drop-down list.
- Add a Group Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Group.

An alternate option is to create SIF Groups through the SIF Diagram:

- Select the SIF Safeguard node. This will open a ‘Safeguard’ view on the right-hand side of the app.
- Navigate to the Diagram and select the ‘New’ button and select ‘Sensor Group’ or ‘Final Element Group’ from the drop-down list.
- While on your SIF, under Diagram, click ‘New’. This gives you an option to create a new Sensor or Final Element Group.

After choosing, the group is automatically created. SILstat does not prompt you to change the name and description; users change the name through choosing the group on the left-hand side tree view.

To create SIF Groups through the Hierarchy Children:

- Select the SIF Safeguard node. This will open a ‘Safeguard’ view on the right-hand side of the app.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select the ‘New’ button and select ‘Sensor Group’ or ‘Final Element Group’ from the drop-down list.
- Add a Group Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Group.

13.3.9 Creating Tags

To create Tags from an Area Node:

- Navigate to an ‘Area’ node in the hierarchy.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Under ‘Tags’, select ‘New’.
- Enter a Tag Name and Description.
- Select the ‘Create’ button to create the Tag.

An alternate option is to create a Tag from a Unit Node.

- Navigate to a ‘Unit’ node in the hierarchy.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Under ‘Tags’, select ‘New’.
- Enter a Tag Name and Description.
- Select the ‘Create’ button to create the Tag.

A second alternate option is to create a Tag from an Equipment Node.

- Navigate to an ‘Equipment’ node in the hierarchy.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Under ‘Tags’, select ‘New’.
- Enter a Tag Name and Description.
- Select the ‘Create’ button to create the Tag.

Currently, there is no limit on how many tags you can create.

13.4 Building a Safeguards Hierarchy

This section describes how a Safeguards Hierarchy can be build withing SILstat. As you create new entities, i.e. an area, a hazard, etc. you should remember that every new item will be defaulted to a draft until you press "Create".

Within the Safeguards hierarchy, it is assumed that you have previously created your SIFs via the Hazards hierarchy, see section *13.3* .

13.4.1 Creating an Area

To create an Area:

- Go to Library, select ‘Area’, then ‘New’.
- Select an Area Type from the drop-down list.
- Add an Area Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Area.

Another way to create an Area is to go to Configuration and Create a New Area. Create your high-level hierarchy with options for user-defined Areas, Process Areas, Units, and Equipment.

13.4.2 Creating a Unit Node

To create a Unit Node:

- Select the Safeguards hierarchy view on the left-side panel.
- Navigate to an ‘Area’ node in the hierarchy. Right click to see ‘New’ and ‘Associate’ buttons appear.
- Select ‘New’ or use the drop-down menu and select ‘Unit’. This will open a ‘Unit’ view on the right-hand side of the app.
- Enter a Unit Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Unit node.

An alternate option is to create a Unit Node from the Area:

- Select the Area.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select ‘New’ to create a new Unit node. You will be automatically loaded into the Unit creation page.
- Enter a Unit Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Unit.

13.4.3 Creating an Equipment Node

To create an Equipment Node:

- Select the Safeguards hierarchy view on the left-side panel.
- Navigate to an ‘Area’ node in the hierarchy. Right click to see ‘New’ and ‘Associate’ buttons appear.
- Select ‘New’ or use the drop-down menu and select ‘Equipment’. This will open an ‘Equipment’ view on the right-hand side of the app.
- Enter an Equipment Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Equipment.

An alternate option is to create an Equipment Node from the Area:

- Select the Area.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select ‘New’ to create a new Equipment node. You will be automatically loaded into the Equipment creation page.
- Enter an Equipment Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Equipment.

A second alternate option is to create an Equipment Node from the Unit Node:

- Select the Hazards hierarchy view on the left-side panel.
- Navigate to a ‘Unit’ node in the hierarchy. Right click to see ‘Equipment and ‘Associate’ buttons appear.
- Select ‘Equipment’. This will open an ‘Equipment’ view on the right-hand side of the app.
- Enter an Equipment Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Equipment.

13.4.4 Creating a SIF

To create a new SIF:

Navigate to the ‘Initiating Event’ node in the hierarchy. Right click to see ‘New’ and ‘Associate’ buttons appear.

- Select ‘New’ or the drop-down menu to see options for adding a SIF Safeguard, Alarm Safeguard, Other Safeguard, Enabling Condition, and Conditional Modifier. When users click "New", a SIF Safeguard is the default.
- Selecting a SIF Safeguard will open a ‘Safeguard’ view on the right-hand side of the app.
- Add a Safeguard Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the SIF Safeguard.

Once a SIF is created, the groups (Sensor, Logic Solver, and Final Element) are automatically created, linked, and appear in the tree view. The groups remain in drafts until created.

An alternate option is to create a new SIF Safeguard through the Hazard diagram view:

- Select the Hazard node. This will open a ‘Hazard’ view on the right-hand side of the app.
- Navigate to the Diagram and select the ‘New’ button and select ‘SIF Safeguard’ from the drop-down list. If a SIF Safeguard is chosen, an Initiating Event must also be associated with your SIF.
- Once selected, this will open an ‘SIF Safeguard’ view on the right-hand side of the app.
- Add a Safeguard Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the SIF Safeguard.

To create a SIF through the hierarchy view:

- Select the Hazard node. This will open a ‘Hazard’ view on the right-hand side of the app.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select the ‘New’ button and select ‘SIF Safeguard’ from the drop-down list. If a SIF Safeguard is chosen, an Initiating Event must also be associated with your SIF.
- Once selected, this will open an ‘SIF Safeguard’ view on the right-hand side of the app.
- Add a Safeguard Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the SIF Safeguard.

13.4.5 Adding SIF Groups

To add SIF Groups:

Although the SIF groups (Sensor, Logic Solver, and Final Element) are automatically created when a SIF is made, users can manually create/add groups.

- Navigate to an ‘SIF Safeguard’ node in the hierarchy. Right click to see ‘New’ button appear.
- Select the ‘New’ button and select ‘Sensor Group’ or ‘Final Element Group’ from the drop-down list.
- Add a Group Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Group.

An alternate option is to create SIF Groups through the SIF Diagram:

- Select the SIF Safeguard node. This will open a ‘Safeguard’ view on the right-hand side of the app.
- Navigate to the Diagram and select the ‘New’ button and select ‘Sensor Group’ or ‘Final Element Group’ from the drop-down list.
- While on your SIF, under Diagram, click ‘New’. This gives you an option to create a new Sensor or Final Element Group.

After choosing, the group is automatically created. SILstat does not prompt you to change the name and description; users change the name through choosing the group on the left-hand side tree view.

To create SIF Groups through the Hierarchy Children:

- Select the SIF Safeguard node. This will open a ‘Safeguard’ view on the right-hand side of the app.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select the ‘New’ button and select ‘Sensor Group’ or ‘Final Element Group’ from the drop-down list.
- Add a Group Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Group.

13.4.6 Creating Tags

To create Tags from an Area Node:

- Navigate to an ‘Area’ node in the hierarchy.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Under ‘Tags’, select ‘New’.
- Enter a Tag Name and Description.
- Select the ‘Create’ button to create the Tag.

An alternate option is to create a Tag from a Unit Node.

- Navigate to a ‘Unit’ node in the hierarchy.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Under ‘Tags’, select ‘New’.
- Enter a Tag Name and Description.
- Select the ‘Create’ button to create the Tag.

A second alternate option is to create a Tag from an Equipment Node.

- Navigate to an ‘Equipment’ node in the hierarchy.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Under ‘Tags’, select ‘New’.
- Enter a Tag Name and Description.
- Select the ‘Create’ button to create the Tag.

Currently, there is no limit on how many tags you can create.

13.5 Building a Procedures Hierarchy

This section describes how a Procedures Hierarchy can be build withing SILstat. As you create new entities, i.e. an area, a procedure, etc. you should remember that every new item will be defaulted to a draft until you press "Create".

Within the Procedures hierarchy, it is assumed that you have previously created your SIFs via the Hazards hierarchy, see section *13.3* .

13.5.1 Creating an Area

To create an Area:

- Go to Library, select ‘Area’, then ‘New’.
- Select an Area Type from the drop-down list.
- Add an Area Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the Area.

Another way to create an Area is to go to Configuration and Create a New Area. Create your high-level hierarchy with options for user-defined Areas, Process Areas, Units, and Equipment.

13.5.2 Creating a Unit Node

To create a Unit Node:

- Select the Procedures hierarchy view on the left-side panel.
- Navigate to an 'Area' node in the hierarchy. Right click to see 'New' and 'Associate' buttons appear.
- Select 'New' or use the drop-down menu and select 'Unit'. This will open a 'Unit' view on the right-hand side of the app.
- Enter a Unit Name and Description. The Name is mandatory for a draft to be saved.
- Select the 'Create' button to create the Unit node.

An alternate option is to create a Unit Node from the Area:

- Select the Area.
- Navigate to the 'Hierarchy' section and select the 'Children' accordion.
- Select 'New' to create a new Unit node. You will be automatically loaded into the Unit creation page.
- Enter a Unit Name and Description. The Name is mandatory for a draft to be saved.
- Select the 'Create' button to create the Unit.

13.5.3 Creating an Equipment Node

To create an Equipment Node:

- Select the Procedures hierarchy view on the left-side panel.
- Navigate to an 'Area' node in the hierarchy. Right click to see 'New' and 'Associate' buttons appear.
- Select 'New' or use the drop-down menu and select 'Equipment'. This will open an 'Equipment' view on the right-hand side of the app.
- Enter an Equipment Name and Description. The Name is mandatory for a draft to be saved.
- Select the 'Create' button to create the Equipment.

An alternate option is to create an Equipment Node from the Area:

- Select the Area.
- Navigate to the 'Hierarchy' section and select the 'Children' accordion.
- Select 'New' to create a new Equipment node. You will be automatically loaded into the Equipment creation page.
- Enter an Equipment Name and Description. The Name is mandatory for a draft to be saved.
- Select the 'Create' button to create the Equipment.

A second alternate option is to create an Equipment Node from the Unit Node:

- Select the Hazards hierarchy view on the left-side panel.
- Navigate to a 'Unit' node in the hierarchy. Right click to see 'Equipment and 'Associate' buttons appear.
- Select 'Equipment'. This will open an 'Equipment' view on the right-hand side of the app.
- Enter an Equipment Name and Description. The Name is mandatory for a draft to be saved.
- Select the 'Create' button to create the Equipment.

To assigning Procedures in the Equipment Node:

- Open the Assigned Procedures node.
- Press ‘Add’.
- Once the pop-over screen opens, use the toggle switch with the procedure you wish to add.
- This will add the selected procedure into a grid within the accordion.

More procedures can be added by pressing ‘Edit’. Procedures can also be removed by pressing ‘Disassociate’.

13.5.4 Creating a SIF

To create a new SIF:

Navigate to the ‘Initiating Event’ node in the hierarchy. Right click to see ‘New’ and ‘Associate’ buttons appear.

- Select ‘New’ or the drop-down menu to see options for adding a SIF Safeguard, Alarm Safeguard, Other Safeguard, Enabling Condition, and Conditional Modifier. When users click "New", a SIF Safeguard is the default.
- Selecting a SIF Safeguard will open a ‘Safeguard’ view on the right-hand side of the app.
- Add a Safeguard Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the SIF Safeguard.

Once a SIF is created, the groups (Sensor, Logic Solver, and Final Element) are automatically created, linked, and appear in the tree view. The groups remain in drafts until created.

An alternate option is to create a new SIF Safeguard through the Hazard diagram view:

- Select the Hazard node. This will open a ‘Hazard’ view on the right-hand side of the app.
- Navigate to the Diagram and select the ‘New’ button and select ‘SIF Safeguard’ from the drop-down list. If a SIF Safeguard is chosen, an Initiating Event must also be associated with your SIF.
- Once selected, this will open an ‘SIF Safeguard’ view on the right-hand side of the app.
- Add a Safeguard Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the SIF Safeguard.

To create a SIF through the hierarchy view:

- Select the Hazard node. This will open a ‘Hazard’ view on the right-hand side of the app.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Select the ‘New’ button and select ‘SIF Safeguard’ from the drop-down list. If a SIF Safeguard is chosen, an Initiating Event must also be associated with your SIF.
- Once selected, this will open an ‘SIF Safeguard’ view on the right-hand side of the app.
- Add a Safeguard Name and Description. The Name is mandatory for a draft to be saved.
- Select the ‘Create’ button to create the SIF Safeguard.

Within the SIF node, you can add Assigned Procedures. Procedures are created in the Library, see section *11.1 Procedures*. To assign a Procedure in the SIF Node:

- Navigate to the Procedures area
- Open the Assigned Procedures node.
- Press ‘Add’.
- Once the pop-over screen opens, use the toggle switch with the procedure you wish to add.
- This will add the selected procedure into a grid within the accordion.

More procedures can be added by pressing ‘Edit’. Procedures can also be removed by pressing ‘Disassociate’. The Inherited Procedures, procedures assigned to parent nodes, will also be shown.

13.5.5 Adding SIF Groups

Although the SIF groups (Sensor, Logic Solver, and Final Element) are automatically created when a SIF is made, users can manually create/add groups.

To add SIF Groups:

- Navigate to an 'SIF Safeguard' node in the hierarchy. Right click to see 'New' button appear.
- Select the 'New' button and select 'Sensor Group' or 'Final Element Group' from the drop-down list.
- Add a Group Name and Description. The Name is mandatory for a draft to be saved.
- Select the 'Create' button to create the Group.

An alternate option is to create SIF Groups through the SIF Diagram:

- Select the SIF Safeguard node. This will open a 'Safeguard' view on the right-hand side of the app.
- Navigate to the Diagram and select the 'New' button and select 'Sensor Group' or 'Final Element Group' from the drop-down list.
- While on your SIF, under Diagram, click 'New'. This gives you an option to create a new Sensor or Final Element Group.

After choosing, the group is automatically created. SILstat does not prompt you to change the name and description; users change the name through choosing the group on the left-hand side tree view.

To create SIF Groups through the Hierarchy Children:

- Select the SIF Safeguard node. This will open a 'Safeguard' view on the right-hand side of the app.
- Navigate to the 'Hierarchy' section and select the 'Children' accordion.
- Select the 'New' button and select 'Sensor Group' or 'Final Element Group' from the drop-down list.
- Add a Group Name and Description. The Name is mandatory for a draft to be saved.
- Select the 'Create' button to create the Group.

Within the SIF groups, you can add Assigned Procedures. To assign a Procedure in the SIF groups:

- Navigate to the Procedures area.
- Open the Assigned Procedures node.
- Press 'Add'.
- Once the pop-over screen opens, use the toggle switch with the procedure you wish to add.
- This will add the selected procedure into a grid within the accordion.

More procedures can be added by pressing 'Edit'. Procedures can also be removed by pressing 'Disassociate'. The Inherited Procedures, procedures assigned to parent nodes, will also be shown.

13.5.6 Creating Tags

To create Tags from an Area Node:

- Navigate to an ‘Area’ node in the hierarchy.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Under ‘Tags’, select ‘New’.
- Enter a Tag Name and Description.
- Select the ‘Create’ button to create the Tag.

An alternate option is to create a Tag from a Unit Node.

- Navigate to a ‘Unit’ node in the hierarchy.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Under ‘Tags’, select ‘New’.
- Enter a Tag Name and Description.
- Select the ‘Create’ button to create the Tag.

A second alternate option is to create a Tag from an Equipment Node.

- Navigate to an ‘Equipment’ node in the hierarchy.
- Navigate to the ‘Hierarchy’ section and select the ‘Children’ accordion.
- Under ‘Tags’, select ‘New’.
- Enter a Tag Name and Description.
- Select the ‘Create’ button to create the Tag.

Currently, there is no limit on how many tags you can create.

Part 4

Collection

Chapter 14 Collection

Collection allows you to record Lifecycle events that are critical within your process, it is at the core of SILstat's functionality. The collected data is key to the evaluation of your actual performance compared to the assumed performance. The collection event types that are used in SILstat are:

- Install
- Bypass
- Decommission
- Move
- Failure
- Repair
- Replace
- Hazard
- Procedure

The navigation tree in the SILstat Collection section knows 4 different views of your plant hierarchy:

- Physical
- Hazards
- Safeguards
- Procedures

The following table summarizes the relevant plant hierarchy views and applicable hierarchy nodes for the identified collection events.

Collection Event Type	Plant Hierarchy View	Plant Hierarchy View
Install	All	Areas (Process Area, Unit, Equipment, etc.)
		Tags & Sub-tags
		Devices
Bypass	All	Areas (Process Area, Unit, Equipment, etc.)
		Tags & Sub-tags
Decommission	All	Areas (Process Area, Unit, Equipment, etc.)
		Tags & Sub-tags
		Devices
Move	All	Areas (Process Area, Unit, Equipment, etc.)
		Tags & Sub-tags
		Devices
Failure	All	Devices
Repair	All	Devices
Replace	All	Devices
Hazard	Hazards	Hazard Scenarios
		Initiating Events
Procedure	Procedures	Procedures

14.1 Recording Events

To record a Collection Event through the Plant Hierarchy, select a Plant Hierarchy view and navigate to the desired Node. Upon selecting the Node, the Node's view will show on the right-hand side as read-only. At the top of the view, select the 'Record' button. This will provide options for Collection Events that can be recorded against that node.

Alternatively, you can right-click the desired Node and see a drop-down list. This will provide options for Collection Events that can be recorded against that node.

14.1.1 Plant Hierarchy View - Physical

The Physical hierarchy view represents the location of each Area, Process Area, Unit, Equipment, Tag, and Device defined within the SILstat environment. The following Collection Events can be recorded from the Physical Plant Hierarchy.

Plant Hierarchy Node	Collection Event Type
Areas (Process Area, Unit, Equipment, etc.)	Install
	Bypass
	Decommission
Tags & Sub-tags	Install
	Bypass
	Decommission
Devices	Install
	Bypass
	Failure
	Repair
	Replace
	Move
	Decommission

14.1.2 Plant Hierarchy View - Hazards

The Hazards hierarchy view groups items associated with a Hazard Scenario together, showing Initiating Events, Modifiers, and all Safeguards as children of a Hazard Scenario. If an Initiating Event, Modifier, or Safeguard is re-used across multiple Hazard Scenarios, it will be listed for each Hazard in the Hazards hierarchy view. The link symbol next to the name signifies that it has been reused / linked / associated in multiple areas. The following Collection Events can be recorded from the Hazards Plant Hierarchy.

Plant Hierarchy Node	Collection Event Type
Areas (Process Area, Unit, Equipment, etc.)	Install
	Bypass
	Decommission
Tags & Sub-tags	Install
	Bypass
	Decommission
Devices	Install
	Bypass
	Failure
	Repair
	Replace
	Move
	Decommission
Hazard Scenarios & Initiating Events	Hazard Event

14.1.3 Plant Hierarchy View - Safeguards

The Safeguards hierarchy view groups items within a Safeguard together, showing the logical relationship between Tags. You will see the Area, Process Area, Unit, Equipment, and all Safeguards including SIFs, Alarms, Relief Devices, etc. Expanding the SIF Safeguards shows the Sensor, Logic Solver, and Final Element parts. If a Tag or Device is re-used across multiple SIFs, it will be listed for each SIF Safeguard in the Safeguard hierarchy view. The link symbol next to the name signifies that it has been reused / linked / associated in multiple areas. The following Collection Events can be recorded from the Safeguard Plant Hierarchy

Plant Hierarchy Node	Collection Event Type
Areas (Process Area, Unit, Equipment, etc.)	Install
	Bypass
	Decommission
Tags & Sub-tags	Install
	Bypass
	Decommission

Plant Hierarchy Node	Collection Event Type
Devices	Install
	Bypass
	Failure
	Repair
	Replace
	Move
	Decommission

14.1.4 Plant Hierarchy View - Procedures

The Procedure hierarchy view shows proof tests and procedures assigned throughout your SILstat hierarchy. Depending on their scope, Procedures can be assigned to Units, Equipment, Safeguards, and Tags. If a Procedure is assigned to multiple Areas, it will be listed for each one. Selecting a Procedure will show you where the instance of the Procedure is applied to in that specific part of the hierarchy. The following Collection Events can be recorded from the Procedures Plant Hierarchy.

Plant Hierarchy Node	Collection Event Type
Areas (Process Area, Unit, Equipment, etc.)	Install
	Bypass
	Decommission
Tags & Sub-tags	Install
	Bypass
	Decommission
Devices	Install
	Bypass
	Failure
	Repair
	Replace
	Move
	Decommission
Procedures	Proof Test
	Procedure

14.2 Installation Events

Installation Events, or Install Events for short, can be initiated in the Collection section, by selecting *Area Lifecycle* or *Device Lifecycle* buttons, then selecting *Install* from the drop-down. Alternatively, Install Events can be initiated by navigating through the hierarchy and selecting a Node to be installed. See section *14.1 Recording Events* for Event options included in each Hierarchy view.

Once initiated, the Install Event view will show on the right-hand side of the application. Here you can specify the details of the event:

1. The ***Where*** section allows you to specify the Node to be installed. For Events initiated through the hierarchy, the selected node will be listed. If not yet specified, select the 'Select Where' button. A plant hierarchy view will appear in a panel to the far right. Navigate through the hierarchy to find the Node to be installed. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
2. The ***When*** section allows you to specify the Installation Date. By default, the date is the current date. You can select the 'Show Time' toggle switch to enter a Time. You can select the 'Date Range' toggle switch to specify a Start and End date. By default, the date range is one day. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
3. The ***Options*** section allows you to specify more details about your event. For Install Events, you can select the option to align all assigned procedure start dates with the install date. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
4. The ***Details*** section includes all relevant information for this event. You can specify a Name, Description, and include Common Properties (Custom Data, Resources, References, Labels) for the event.

Once each section is completed, press Confirm at either the top or bottom of the screen. As SILstat processes the event, the following notifications may be provided:

1. The event is queued for processing.
2. The event has been successfully completed.
3. The event is awaiting approval.
4. The event has been approved.
5. The event has been rejected.
6. Error

Install Events can be recorded in bulk or on one specific node. To record in bulk, select multiple Nodes to install in the Where Section of the Install Event.

14.3 Bypass Events

Bypass Events can be initiated in the Collection section, by selecting the *Bypass* button. Alternatively, Bypass Events can be initiated by navigating through the hierarchy and selecting a Node to be bypassed. Seee section *14.1 Recording Events* for Event options included in each Hierarchy view.

Once initiated, the Bypass Event view will show on the right-hand side of the application. Here you can specify the details of the event:

1. The ***Where*** section allows you to specify the Node to be bypassed. For Events initiated through the hierarchy, the selected node will be listed. If not yet specified, select the 'Select Where' button. A plant hierarchy view will appear in a panel to the far right. Navigate through the hierarchy to find the Node to be bypassed, or an existing bypass. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
2. The ***When*** section allows you to specify the Bypass Date. By default, the date is the current date. You can select the 'Show Time' toggle switch to enter a Time. You can select the 'Date Range' toggle switch to specify a Start and End date. By default, the date range is one day. *Please Note: For a Bypass Event, you cannot choose an end date in the future. If the Start Date is specified only, the device will remain in the 'Bypassed' State. To end a bypass, update an existing Bypass Event with an end date, or you can create a new Bypass Event that specifies an end date.* Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
3. The ***Details*** section includes all relevant information for this event. You can specify a Name, Description, and include Common Properties (Custom Data, Resources, References, Labels) for the event.

Once each section is completed, press Confirm at either the top or bottom of the screen. As SILstat processes the event, the following notifications may be provided:

1. The event is queued for processing.
2. The event has been successfully completed.
3. The event is awaiting approval.
4. The event has been approved.
5. The event has been rejected.
6. Error

14.4 Failure Events

Failure Events can be initiated in the Collection section, by selecting the *Failure* button. Alternatively, Failure Events can be initiated by navigating through the hierarchy and selecting the failed Device. See section *14.1 Recording Events* for Event options included in each Hierarchy view. Finally, Failure Events may be initiated after a failed Procedure Event or a Hazard Event.

Once initiated, the Failure Event view will show on the right-hand side of the application. Here you can specify the details of the event:

1. The ***Where*** section allows you to specify the failed Device. For Events initiated through the hierarchy, the selected device will be listed. If not yet specified, select the 'Select Where' button. A plant hierarchy view will appear in a panel to the far right. Navigate through the hierarchy to find the failed Device. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
2. The ***When*** section allows you to specify the Failure Date. By default, the date is the current date. You can select the 'Show Time' toggle switch to enter a Time. You can select the 'Date Range' toggle switch to specify a Start and End date. By default, the date range is one day. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
3. The ***How*** or ***Why*** (if the Failure Event is associated with a Hazard Event) section refers to how the failure occurred. The Detection Method can be chosen from a drop-down menu.
4. The ***Failure Classifications*** section provides a grid showing the Device associated with the Failure Event. The Tag, Name, and Device Type are shown. Here you can specify the Failure Classification from a drop-down list.
5. The ***Details*** section includes all relevant information for this event. You can specify a Name, Description, and include Common Properties (Custom Data, Resources, References, Labels) for the event.

Once each section is completed, press Confirm at either the top or bottom of the screen. As SILstat processes the event, the following notifications may be provided:

1. The event is queued for processing.
2. The event has been successfully completed.
3. The event is awaiting approval.
4. The event has been approved.
5. The event has been rejected.
6. Error

Once the Failure Event is confirmed / occurred, you have the option to repair or replace the affected device. See section *14.5* for Repair Events and Section *14.6* for Replace Events.

Please note: Failure Classifications can be specified in SILstat Settings. See Section XXX for more details.

14.5 Repair Events

Repair Events can be initiated in the Collection section, by selecting the *Device Lifecycle* button, and selecting *Repair* from the drop-down. Alternatively, Repair Events can be initiated by navigating through the hierarchy and selecting the repaired Device. See section *14.1 Recording Events* for Event options included in each Hierarchy view. Finally, Repair Events may be recorded as part of a Failure Event.

Once initiated, the Repair Event view will show on the right-hand side of the application. Here you can specify the details of the event:

1. The ***Where*** section allows you to specify the failed Device. For Events initiated through the hierarchy or as part of a Failure Event, the selected device will be listed. If not yet specified, select the 'Select Where' button. A plant hierarchy view will appear in a panel to the far right. Navigate through the hierarchy to find the repaired Device. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
2. The ***When*** section allows you to specify the Repair Date. By default, the date is the current date. You can select the 'Show Time' toggle switch to enter a Time. You can select the 'Date Range' toggle switch to specify a Start and End date. By default, the date range is one day. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
3. The ***Devices to Repair*** section provides a grid showing the Device associated with the Repair Event. The Tag, Name, and Device Type are shown . Here you can specify the Repair Type from a drop-down list.
4. The ***Details*** section includes all relevant information for this event. You can specify a Name, Description, and include Common Properties (Custom Data, Resources, References, Labels) for the event.

Once each section is completed, press Confirm at either the top or bottom of the screen. As SILstat processes the event, the following notifications may be provided:

1. The event is queued for processing.
2. The event has been successfully completed.
3. The event is awaiting approval.
4. The event has been approved.
5. The event has been rejected.
6. Error

Please note: Repair Types can be specified in SILstat Settings. See Section XXX for more details.

14.6 Replace Events

Replace Events can be initiated in the Collection section, by selecting the *Device Lifecycle* button, and selecting *Replace* from the drop-down. Alternatively, Replace Events can be initiated by navigating through the hierarchy and selecting the replaced Device. See section *14.1 Recording Events* for Event options included in each Hierarchy view. Finally, Replace Events may be recorded as part of a Failure Event.

Once initiated, the Replace Event view will show on the right-hand side of the application. Here you can specify the details of the event:

1. The ***Why*** section allows you to specify the associated Failure Event for the Device to be replaced (and related Events). To do this...
2. The ***Device Replacement*** section allows you to choose the replacement device from the devices available in your database. At present, you can only replace one device at a time. To do this…
3. The ***Where*** section allows you to specify the replaced Device. For Events initiated through the hierarchy or as part of a Failure Event, the selected device will be listed. If not yet specified, select the 'Select Where' button. A plant hierarchy view will appear in a panel to the far right. Navigate through the hierarchy to find the replaced Device. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
4. The ***When*** section allows you to specify the Replacement Date. By default, the date is the current date. You can select the 'Show Time' toggle switch to enter a Time. You can select the 'Date Range' toggle switch to specify a Start and End date. By default, the date range is one day. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
5. The ***Details*** section includes all relevant information for this event. You can specify a Name, Description, and include Common Properties (Custom Data, Resources, References, Labels) for the event.

Once each section is completed, press Confirm at either the top or bottom of the screen. As SILstat processes the event, the following notifications may be provided:

1. The event is queued for processing.
2. The event has been successfully completed.
3. The event is awaiting approval.
4. The event has been approved.
5. The event has been rejected.
6. Error

Please note: Only Devices not in service can be used as replacement. New Devices can be added to the Library, see section *10.3 Devices* for more details.

14.6 Move Events

Move Events allow you to reconfigure the hierarchy after installation. Configuration permissions are required for these events. Move Events can be initiated in the Collection section, by selecting *Area Lifecycle* or *Device Lifecycle* buttons, then selecting *Move* from the drop-down. Alternatively, Move Events can be initiated by navigating through the hierarchy and selecting a Node to be moved. See section *14.1 Recording Events* for Event options included in each Hierarchy view.

Once initiated, the Move Event view will show on the right-hand side of the application. Here you can specify the details of the event:

1. The ***Where*** section allows you to specify the Node to be moved. For Events initiated through the hierarchy, the selected node will be listed. If not yet specified, select the 'Select Where' button. A plant hierarchy view will appear in a panel to the far right. Navigate through the hierarchy to find the Node to be moved.
   Next, select the Destination the Node will be moved to. Under 'Destination' select the 'Select Where' button. A plant hierarchy view will appear in a panel to the far right. Navigate through the hierarchy to select where the Node will be moved to.
   Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
2. The ***When*** section allows you to specify the Installation Date. By default, the date is the current date. You can select the 'Show Time' toggle switch to enter a Time. You can select the 'Date Range' toggle switch to specify a Start and End date. By default, the date range is one day. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
3. The ***Details*** section includes all relevant information for this event. You can specify a Name, Description, and include Common Properties (Custom Data, Resources, References, Labels) for the event.

Once each section is completed, press Confirm at either the top or bottom of the screen. As SILstat processes the event, the following notifications may be provided:

1. The event is queued for processing.
2. The event has been successfully completed.
3. The event is awaiting approval.
4. The event has been approved.
5. The event has been rejected.
6. Error

14.6 Decommission Events

Decommission Events can be initiated in the Collection section, by selecting *Area Lifecycle* or *Device Lifecycle* buttons, then selecting *Decommission* from the drop-down. Alternatively, Decommission Events can be initiated by navigating through the hierarchy and selecting a Node to be decommissioned. See section *14.1 Recording Events* for Event options included in each Hierarchy view.

Once initiated, the Decommission Event view will show on the right-hand side of the application. Here you can specify the details of the event:

1. The ***Where*** section allows you to specify the Node to be removed. For Events initiated through the hierarchy, the selected node will be listed. If not yet specified, select the 'Select Where' button. A plant hierarchy view will appear in a panel to the far right. Navigate through the hierarchy to find the Node to be removed. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
2. The ***When*** section allows you to specify the Removal Date. By default, the date is the current date. You can select the 'Show Time' toggle switch to enter a Time. You can select the 'Date Range' toggle switch to specify a Start and End date. By default, the date range is one day. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
3. The ***Options*** section allows you to specify more details about your event. For Decommission Events, you can select the *Discard* option. This indicates that you are discarding the node from the hierarchy and do not want to record any data on it. If chosen, it will be marked as deleted and will discard any data from the database. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
4. The ***Details*** section includes all relevant information for this event. You can specify a Name, Description, and include Common Properties (Custom Data, Resources, References, Labels) for the event.

Once each section is completed, press Confirm at either the top or bottom of the screen. As SILstat processes the event, the following notifications may be provided:

1. The event is queued for processing.
2. The event has been successfully completed.
3. The event is awaiting approval.
4. The event has been approved.
5. The event has been rejected.
6. Error

14.6 Hazard Events

Hazard Events can be initiated in the Collection section, by selecting the *Hazard* button. Alternatively, Hazard Events can be initiated by navigating through the hierarchy and selecting a Hazard Scenario or Initiating Event Node. See section *14.1 Recording Events* for Event options included in each Hierarchy view.

Once initiated, the Hazard Event view will show on the right-hand side of the application. Here you can specify the details of the event:

1. The ***Where*** section allows you to specify the Hazard Scenario or Initiating Event Node. For Events initiated through the hierarchy, the selected node will be listed. If not yet specified, select the 'Select Where' button. A plant hierarchy view will appear in a panel to the far right. Navigate through the hierarchy to find the Hazard Scenario or Initiating Event Node. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
2. The ***When*** section allows you to specify the Hazard Date. By default, the date is the current date. You can select the 'Show Time' toggle switch to enter a Time. You can select the 'Date Range' toggle switch to specify a Start and End date. By default, the date range is one day. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
3. The ***Safeguards*** section provides a diagram showing your Hazard Scenario. The diagram displays Initiating Events and Safeguards associated with the Hazard. An Advanced view of the diagram shows Enabling Conditions, Conditional Modifiers, and Safeguards that are not credited for this Hazard. If a Safeguard succeeded at the time of the Hazard, select that safeguard in the diagram. This provides options to indicate if the safeguard partially succeeded or succeeded. SILstat will assume safeguards preceding the successful safeguard failed, and safeguards listed after were not called to action.
4. The ***Details*** section includes all relevant information for this event. You can specify a Name, Description, and include Common Properties (Custom Data, Resources, References, Labels) for the event.

Once each section is completed, press Confirm at either the top or bottom of the screen. Upon confirmation, a Resolution section appears. This shows all failed devices associated with the Hazard Event, including their Tag, Name, Initiating Event, and Hazard. In the *Failure Event* column, select *New* to initiate a Failure Collection event. Any associated Repair or Replacement event will show in the *Resolution* column. See section *14.4* , *14.5* , and *14.6* respectively, for more details on the Failure, Repair, and Replace Events.

As SILstat processes the event, the following notifications may be provided:

1. The event is queued for processing.
2. The event has been successfully completed.
3. The event is awaiting approval.
4. The event has been approved.
5. The event has been rejected.
6. Error

Please note: Hazards can be created in Configuration. See section 13.3 Building a Hazards Hierarchy for more details.

14.6 Procedure Events

Procedure Events can be initiated in the Collection section, by selecting the 'Procedure' button. Alternatively, Procedure Events can be initiated by navigating through the hierarchy and selecting a Procedure Node. See section *14.1 Recording Events* for Event options included in each Hierarchy view.

Once initiated, the Procedure Event view will show on the right-hand side of the application. Here you can specify the details of the event:

1. The ***Where*** section allows you to specify the Procedure Node. For Events initiated through the hierarchy, the selected node will be listed. If not yet specified, select the 'Select Where' button. A plant hierarchy view will appear in a panel to the far right. Navigate through the hierarchy to find the Procedure Node. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
2. The ***When*** section allows you to specify the Procedure Date. By default, the date is the current date. You can select the 'Show Time' toggle switch to enter a Time. You can select the 'Date Range' toggle switch to specify a Start and End date. By default, the date range is one day. Once finished with your selection, press Next. An indication that the step is complete is shown, and the section will collapse to show the next step.
3. The ***Procedure Steps*** section displays each step of the Proof Test or Procedure. Steps are displayed in two view options: Summary (grid version) or Detailed (list version). For each step, a Step Name and Description are shown. If specified, an estimated Step Duration is also shown. Some steps include additional prompts for information. These are mandatory and may determine if the Procedure passes or fails. Complete each procedure step before moving on.
4. The ***Details*** section includes all relevant information for this event. You can specify a Name, Description, and include Common Properties (Custom Data, Resources, References, Labels) for the event.

Once each section is completed, press Confirm at either the top or bottom of the screen. As SILstat processes the event, the following notifications may be provided:

1. The event is queued for processing.
2. The event has been successfully completed.
3. The event is awaiting approval.
4. The event has been approved.
5. The event has been rejected.
6. Error

If a Procedure Event fails, you will be prompted to initiate a Failure Event for associated Devices. See section *14.4* for details on Failure Events.

Please note: Procedures can be created in Configuration. See section 13.5 Building a Procedures Hierarchy for more details.

Part 5

Analysis

Chapter 15 Analysis

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Part 6

Miscellaneous

Abbreviations

ALARP	As Low As Reasonably Practical
BMS	Burner Management System
BPCS	Basic Process Control System
C&E	Cause and Effect
CACE	IEC 62443 Certified Automation Cybersecurity Expert
CACS	IEC 62443 Certified Automation Cybersecurity Specialist
CCF	Common Cause Failure
CFAT	Cybersecurity Factory Acceptance Test
CFATS	Chemical Facility Anti-Terrorism Standards
CFSE	Certified Functional Safety Expert
CFSP	Certified Functional Safety Professional
CHAZOP	Control Hazard & Operability Analysis
CIP	Critical Infrastructure Protection
CISSP	Certified Information Systems Security Professional
CM	Conditional Modifier
CMF	Common Mode Failure
CMR	Countermeasure
COTS	Commercial Off The Shelf
CRC	Cyclical Redundancy Check
CSA	Cybersecurity Assessment
CSAT	Cybersecurity Site Acceptance Test
CSMS	Cybersecurity Management System
CSRS	Cybersecurity Requirements Specification
DCS	Distributed Control System
DMZ	De-Militarized Zone
DNS	Domain Name Service
DoS	Denial of Service
DTT	De-energize To Trip
E/E/PE	Electrical/Electronic/Programmable Electronic
EC	Enabling Condition
EMC	Electro-Magnetic Compatibility
ESD	Emergency Shutdown
ETT	Energize To Trip
FAT	Factory Acceptance Test
FBT	Frequency Based Targets
FMEA	Failure Mode and Effects Analysis
FMEDA	Failure Modes Effects and Diagnostic Analysis
FPL	Fixed Program Language
FSA	Functional Safety Assessment

FSM	Functional Safety Management
FVL	Full Variability Language
H&RA	Hazard and Risk Assessment
HAZID	Hazard Identification Assessment
HAZOP	Hazard and Operability study
HFT	Hardware Fault Tolerance
HMI	Human Machine Interface
IACS	Industrial Automated Control System
ICE	Initiating Cyber Event
IE	Initiating Event
IEC	International Electrotechnical Commission
IIS	Internet Information Services
IP	Internet Protocol
IPL	Independent Protection Layer
ISA	International Society of Automation
IT	Information Technology
KCR	Kill Chain Relevance
LOPA	Layer of Protection Analysis
LVL	Limited Variability Language
MADB	Master Alarm Database
MOC	Management Of Change
MRT	Mean Repair Time
MTTFS	Mean Time To Fail Spurious
MTTR	Mean Time To Restoration
NERC	North American Electric Reliability Council
NIST	National institute of Standards and Technology
OS	Operating System
OT	Operations Technology
PFD	Probability of Failure on Demand
PFD_{AVG}	Average Probability of Failure on Demand
PFH	Probability of a Dangerous Failure per Hour
PHA	Process Hazard Analysis
PIU	Proven In Use / Prior Use
PLC	Programmable Logic Controller
PSI	Process Safety Information
PSCAI	Process Safety Controls, Alarms and Interlocks
PTC	Proof Test Coverage
PTI	Proof Test Interval
QRA	Quantitative Risk Assessment
RAGAGEP	Recognized and Generally Accepted Good Engineering Practice
RRF	Risk Reduction Factor
SAT	Site Acceptance Test

SCADA	Supervisory Control and Data Acquisition
SERH	Safety Equipment Reliability Handbook
SFF	Safe Failure Fraction
SIF	Safety Instrumented Function
SIL	Safety Integrity Level
SILac	Achieved Safety Integrity Level based on Architectural Constraints
SILcap	Achieved Safety Integrity Level based on Equipment Systematic Capability
SILpfd	Achieved Safety Integrity Level based on Safety Instrumented Function probability of failure
SIS	Safety Instrumented System
SL	Security Level
SL-A	Security Level Achieved
SL-C	Security Level Capability
SL-T	Security Level Target
SLC	Safety Lifecycle
SOP	Standard Operating Procedure
SRS	Safety Requirements Specification
SSI	Site Safety Index
TA	Target Attractiveness
UD	User Defined
UOM	Unit Of Measure

β-factor	Beta factor, indicating common cause susceptibility
DD	Dangerous Detected
DU	Dangerous Undetected
SD	Safe Detected
SU	Safe Undetected
AD	Annunciation Detected
AU	Annunciation Undetected
No Effect	Failure of a component that is part of the safety critical circuit that has no impact on the successful execution of the safety function

Terms and Definitions

Basic Process Control System	System that responds to input signals from the process, its associated equipment, other programmable systems and/or an operator and generates output signals causing the process and its associated equipment to operate in the desired manner but that does not perform any safety instrumented functions with a claimed SIL greater than or equal to 1.
Batch Process	A process that leads to the production of finite quantities of material by subjecting quantities of input materials to an ordered set of processing activities over a finite period of time using one or more pieces of equipment.
Common Cause Failure	Failure, which is the result of one or more events, causing failures of two or more separate channels in a multiple channel system, leading to system failure.
Common Mode Failure	Failure of two or more channels in the same way, causing the same erroneous result.
Conditional Modifier	One of several possible probabilities included in scenario risk calculations when risk criteria endpoints are expressed in impact terms (e.g., fatalities) instead of in primary loss event terms (e.g., release, vessel rupture). Conditional modifiers include, but are not necessarily limited to: • Probability of a hazardous atmosphere • Probability of ignition or initiation • Probability of explosion • Probability of personnel presence • Probability of injury or fatality • Probability of equipment damage or other financial impact
Consequence	The undesirable result of an incident, usually measured in health and safety effects, environmental impacts, loss of property, and business interruption costs.
Enabling Condition	A condition that makes possible the initiating event or initiating cause of a scenario. An enabling condition is neither a failure nor a protection layer. It consists of an operation or condition that does not directly cause the scenario, but that must be present or active in order for the scenario to proceed to a loss event. Note that mitigating factors, such as the probability of personnel presence or of emergency evacuation, are conditional modifiers and not enabling conditions. The term enabling event is sometimes used for enabling condition. The term enabling condition is preferred, since enabling conditions are not generally events but rather conditional states.
Event	An occurrence involving a process that is caused by equipment performance or human action or by an occurrence external to the process. Events include initiating events, loss events and success or failure of safeguards.

Failure Modes Effects and Diagnostic Analysis	A systematic procedure during which each failure mode of each component is examined to determine the effect of that failure on the system and whether that failure is detected by any automatic diagnostic function.
Hardware Fault Tolerance	The number of dangerous random failures tolerated by a system while still maintaining the ability to successfully perform the safety function.
Hazard Scenario	Scenario that consists of one or more sequence of events that results in a final consequence of concern. Each Hazard Scenario consists of at least one cause - consequence pair.
Impact	A measure of the ultimate loss and harm of a loss event. Impact may be expressed in terms of numbers of injuries and/or fatalities, extent of environmental damage and/or magnitude of losses such as property damage, material loss, loss of intellectual property, lost production, market share loss, and recovery costs.
Incident	An event or sequence of events that either resulted in or had the potential to result in adverse impacts.
Independent Protection Layer	A device, system, or action that is capable of preventing a scenario from proceeding to the undesired consequence regardless of the initiating event or the action of any other protection layer associated with the scenario.
Initiating Event	The event that initiates the scenario leading to the undesired consequence.
Layer of Protection Analysis	An approach that analyzes incident scenario(s) (cause-consequence pair(s)) using values for the initiating event frequencies, enabling conditions, independent protection layer failure probabilities, and conditional modifiers as applicable in order to compare a Hazard Scenario risk estimate to risk criteria to determine if additional risk reduction or more detailed analysis is needed. Scenarios are identified elsewhere, typically using a scenario based hazard evaluation procedure such as a HAZOP Study.
Likelihood	A measure of the expected frequency with which an event occurs. This may be expressed as a frequency (e.g. events per year), a probability of occurrence during a time interval (e.g. annual probability), or a conditional probability (e.g. probability of occurrence, given that a precursor event has occurred).
Mean Repair Time	The expected overall repair time of equipment items in case of a detected failure.
Mean Time To Restoration	The expected time to achieve complete restoration. The mean time to restore encompasses, the time to detect the failure, the time spent before starting the repair, the effective time to repair (the MRT), and the time before the component is put back into operation.
Mission Time	The time period that a SIF is expected to be operational. Typically this period corresponds to the interval when all devices are either replaced or refurbished to “as new condition”. It should not be confused with the proof test interval.

Probability of Failure on Demand	The probability that a system or other protective measure will fail to perform a specified function on demand. PFD is expressed as a dimensionless number ranging from zero to one.
Process Hazard Analysis	A hazard evaluation of broad scope that identifies and analyzes the significance of hazardous situations associated with a process or activity.
Proven In Use / Prior Use	A Proven In Use assessment is a study of product operational hours, revision history, fault reporting system, and field failures to determine if there is evidence of systematic design faults in a product. The IEC 61508 standard provides levels of operational history required for each SIL level.
Quantitative Risk Assessment	The systematic development of numerical estimates of the expected frequency and consequence of potential incidents associated with a facility or operation based on engineering evaluation and mathematical techniques.
Risk	A measure of human injury, environmental damage, economic loss, loss of intellectual property or loss of privacy in terms of both the incident likelihood and the magnitude of the loss or injury. A simplified version of this relationship expresses risk as the product of the likelihood and the consequences (i.e. Risk = Consequence x Likelihood) of an incident.
Risk Assessment	The process by which the results of a risk analysis (i.e. risk estimates) are used to make decisions, either through relative risk ranking of risk reduction strategies or through comparison with tolerable risk levels.
Risk Mitigation	A reduction of risk due to a reduction of the likelihood or impact associated with a loss event.
Risk Receptor	Something which could come to harm, including human health, environment, or financial well-being.
Risk Reduction Factor (RRF) - Achieved	The measure of the degree of risk reduction achieved by a safeguard, countermeasure, or protection strategy. Achieved RRF can be expressed as the ratio of unmitigated risk divided by mitigated risk resulting from that safeguard, countermeasure, or protection strategy. For an independent low demand safety function, this can be expressed as the reciprocal of the average probability of failure on demand.
Risk Reduction Factor (RRF) - Target/Required	The measure of the degree of risk reduction needed to achieve tolerable risk. RRF can be expressed as the ratio of unmitigated risk divided by tolerable risk. Within exSILentia® a distinction is made between *Target* and *Required* RRF. *Target RRF* is used to identify the risk reduction needed to achieve tolerable risk resulting from the LOPA/SIL selection. *Required RRF* is used to identify the risk reduction specified in the SRS which the SIF as designed should meet. The required RRF is typically equal to or greater than the target RRF (if the user decides to round the target RRF).

Risk Tolerance	1. Willingness by authority having jurisdiction to live with a risk so as to secure certain benefits in the confidence that the risk is one that is worth taking and that it is being properly controlled. However, it does not imply that everyone would agree without reservation to take that risk or have it imposed on them. 2. Risk the organization is willing to accept.
Risk Tolerance Criteria	A predetermined measure of risk used to aid decisions about whether further efforts to reduce risk are warranted.
Safety	Freedom from unacceptable risk.
Safety Integrity Level	Discrete level (one out of a possible four) for specifying the safety integrity requirements of the safety functions to be allocated to the electronic / programmable electronic safety-related systems, where safety integrity level 4 has the highest level of safety integrity and safety integrity level 1 has the lowest [IEC 61508-4].
Safety Integrity Level - Target/Required	Within exSILentia® a distinction is made between *Target* and *Required* SIL. *Target SIL* is used to identify the SIL needed to achieve tolerable risk resulting from the LOPA/SIL selection. *Required SIL* is used to identify the SIL specified in the SRS which the SIF as designed should meet. The required SIL is typically equal to the target SIL but would allow different target SILs to result from the different SIL selection methods.
Severity	A measure of the degree of impact of a particular consequence.
SIL Threshold	Parameter to specify the boundary between target Safety Integrity Levels Assume a calculated Required Risk Reduction Factor of 29, which would fall in the 10 - 100 Risk Reduction range. With a SIL Threshold Ratio of 1, a calculated Risk Reduction Factor of 29 would result in a Target SIL of SIL 2. The calculated Risk Reduction Factor is in this case greater than the SIL determination threshold which lies at 10 (10 * 1). With a SIL Threshold Ratio of 3, a calculated Risk Reduction Factor of 29 would result in a Target SIL of SIL 1. The calculated Risk Reduction Factor is in this case less than the SIL determination threshold which lies at 30 (10 * 3).
Startup Time	The time it takes to re-start the process after a shutdown.
Systematic Capability	Indication of systematic failure protection for an equipment item. Per IEC 61511 users of existing hardware either need to select hardware that is developed and assessed per IEC 61508 or justify the use of that hardware. The objective of the assessment or justification is to identify that there are “no” systematic problems with the equipment item under consideration. Systematic failure protection is part of IEC 61508 compliant development processes, alternatively sufficient recorded experience can also be used to identify that there is no known systematic problem.
Useful Life	That portion of life when the failure rate can be described by the exponential distribution, i.e. constant failure rate. The useful life follows infant mortality or burn-in and precedes the wear-out portions of the overall life. For functional safety applications, devices are expected to be replaced at the end of their useful life.

Disclaimer and Assumptions

Limitations and assumptions associated with the use of SILstat™ are documented in the following sections.

Disclaimer

The user of the exSILentia® SILstat™ software is responsible to ensure that all data is entered correctly into the SILstat™ database. Calculations are performed per guidelines in applicable international standards and common methods described in subject matter literature. *exida Innovation LLC* accepts no responsibility for the correctness of the regulations, standards, or literature on which the software tool is based.

In particular, *exida Innovation LLC* accepts no liability for decisions based on the results of the exSILentia® SILstat™ software. The *exida Innovation LLC* guarantee is restricted to the correction of errors or deficiencies within a reasonable period when such errors or deficiencies are brought to the attention of *exida Innovation LLC* in writing. *exida Innovation LLC* accepts no responsibility for adjustments made by the user to any reports and exports automatically generated by the exSILentia® SILstat™ software.

Assumptions exida SERH Database

exida has compiled a proprietary equipment failure database. This database is a compilation of failure data collected from detailed predictive analysis performed through Failure Modes, Effects, and Diagnostics Analysis (FMEDA) for specific manufacturer specific products and a variety of public and confidential sources. The failure rate data presents an average worst-case estimate of failure rates to be expected during normal operation of a particular equipment item. The database is published as the “Safety Equipment Reliability Handbook, fourth edition” ISBN 978-1-934977-15-6. The reliability data collection process is described in the SERH book.

The user is responsible for determining the applicability of the failure data to any particular environment. The stress levels assumed to determine the equipment failure rate are average worst-case for an industrial environment and are documented in the SERH book. Accurate plant specific data is preferable to general industry average data. Industrial plant sites with high levels of stress must use failure rate data that is adjusted to a higher value to account for the specific conditions of the plant.

Assumptions SILstat™

To correctly calculate actual performance-based parameters, it is essential that all data is entered correctly and completely into the SILstat™ database.

When determining failure rates, SILstat™ assumes that 1) all failure records are assigned to a device, 2) all devices are assigned to a device model, and 3) all device models are assigned to a device type. Failure to assign failure records, device, or device models will yield optimistic results.

When determining event frequencies, SILstat™ assumes that 1) all events are recorded and 2) all events are assigned to a hazard scenario. Failure to assign event records or hazard scenarios will yield optimistic results.

When determining demand rates and probability of failures, SILstat™ assumes that 1) all events are recorded, 2) all events are assigned to a hazard scenario, and 3) all corrective actions are adequately documented. Failure to assign event records, hazard scenarios, or corrective actions will yield optimistic results.

When providing a list of procedures due or procedures overdue, SILstat™ assumes that the status of all procedures is kept up to date within the SILstat™ database.

Open Source Disclosure

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