Getting Started Safety Evaluation Tool – SET

Safety Integrated

www.siemens.com/safety-evaluation-tool

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1 General

1.1 Warranty, Liability and Support

The TUEV-approved Safety Evaluation Tool is provided to you free of charge. Therefore, no warranty is granted for the present report with the exception of wilful or fraudulent behavior. This particularly applies to the tool's correctness, freedom from errors, completeness and usability.

Use of the Safety Evaluation Tools is voluntary and subject to your own risk. As far as SIEMENS provides technical support with the tool's use or with report generation, such support is granted on a voluntary basis and without acknowledgement of any statutory duty.

With the exception of personal injury, the liability of SIEMENS and its vicarious agents is solely limited to cases of intent and gross negligence and to the extent of foreseeable and typical damage as generally applied in contracts.

In particular, SIEMENS does not relieve you of your responsibility for fulfilling product safety obligations.

1.2 Description of the Functionality

The SIEMENS Safety Evaluation Tool provides valuable support with the rapid and easy assessment of safety functions in machines and systems.

The TÜV-tested online tool offers step-by-step user guidance, from specification of the safety system's structure, to component selection, down to the determination of the attained safety integrity in accordance with ISO 13849-1 and IEC 62061. This is also supported by the comprehensive integrated libraries.

As a result, the user is provided with a standard-compliant report, which can be integrated in the documentation as safety proof. The decision whether the report can be used for possible acceptance tests is at the discretion of the relevant test center.

Accessing the Safety Evaluation Tool online means you are always able to carry out calculations based on the current standards listed there. You can also call up the latest technical data for all safety-relevant components from SIEMENS.

1.3 Prerequisites

A prerequisite for using the Safety Evaluation Tool is that you carry out a hazard assessment (risk analysis) beforehand which defines the required safety functions.

Here, generally the logical functions with the already envisaged hardware sub-functions (e.g. detection, evaluation and reaction) are to be selected.

Furthermore, the persons in charge (project manager and project inspector) of the final acceptance tests have to be named.

1.4 Important Notes

The Safety Evaluation Tool is an online tool. All created projects are saved locally on your PC, so that you have direct access to the results and you can use them for further safety projects.

If no entries are made for a period exceeding 240 minutes, the online connection will be interrupted after display of a respective note. In this case, any unsaved projects / changes will be deleted.

Therefore, please regularly save your project data via ***File*** > ***Save projects*** or by clicking the Unsaved changes field.

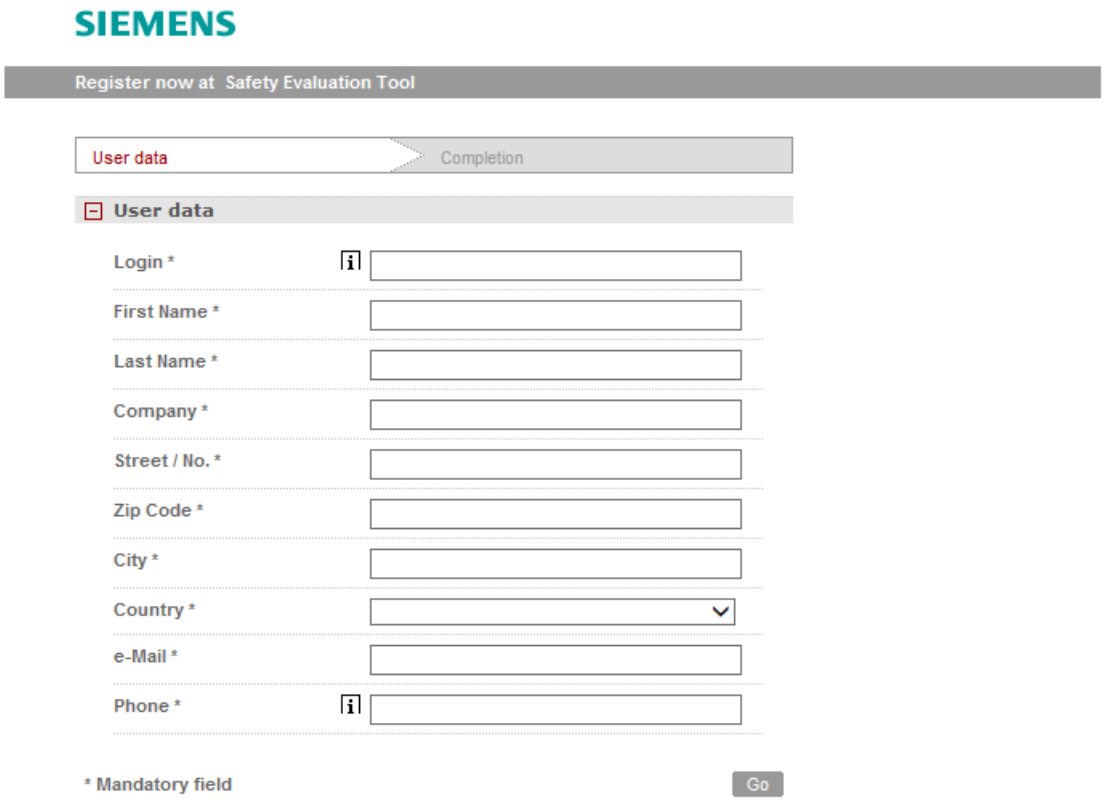
2 Call-Up of the Safety Evaluation Tool

2.1 Link to the Safety Evaluation Tool

www.siemens.com/safety-evaluation-tool

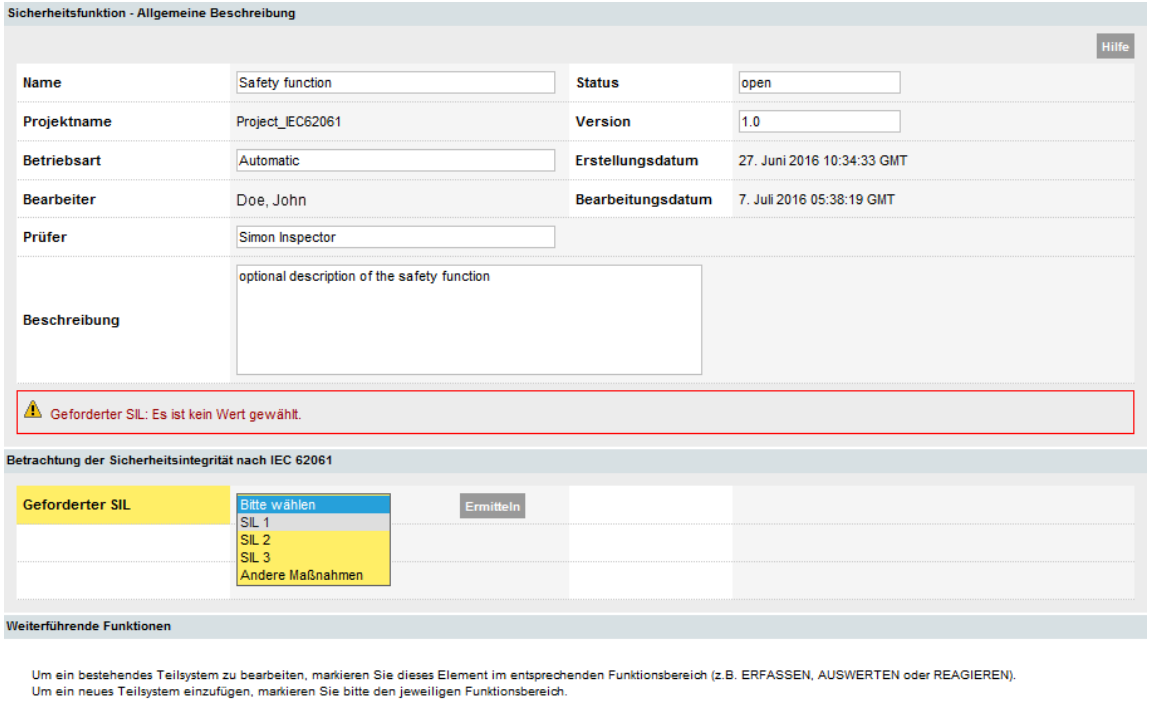
2.2 Registration

Figure 2-1: Registration form for SET



Upon first call-up of the Safety Evaluation Tool, you are requested to register yourself. Please fill in the registration screen completely (* = mandatory field). Please observe that these entries appear in the Safety Evaluation Tool and in the report under ***Last editor***.

Figure 2-2: User Login Name after Registration



Following registration, you will receive an e-mail containing your access data (login name and password) for further use of the Safety Evaluation Tool.

The subsequent first-time registration process comprises some questions which are aimed at better matching our products to your needs in the future.

Of course, the Safety Evaluation Tool's use is free of charge.

3 Operation of the Safety Evaluation Tool

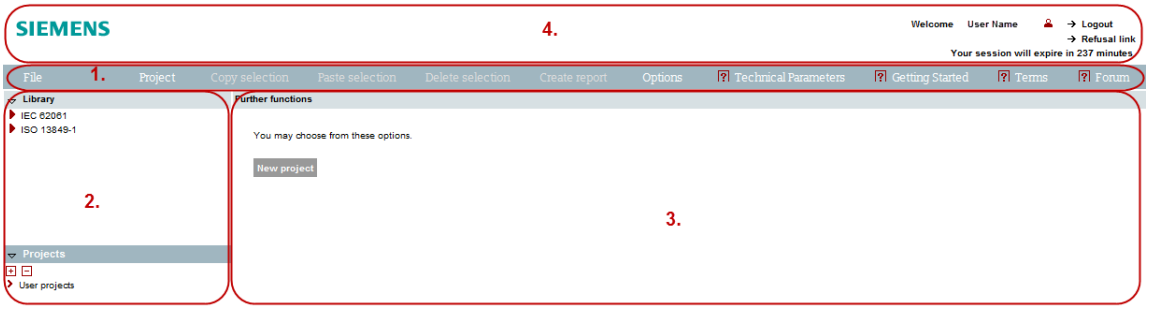
The sections below describe the general functional principle of the Safety Evaluation Tool on the basis of an example.

3.1 Screen layout

Here you find information about the different sections of the SET.

NOTE The font sizes of the screens can be changed in the Internet Explorer via Zoom.

Figure 3-1: Work and user area of SET



The screens of the Safety Evaluation Tool are divided into four general sections:

1. General buttons.
2. Navigation tree of ***Library*** (example projects pre-defined by SIEMENS) and ***Projects*** (customer projects).
3. Workspace in which all required entries are made.
4. Section for display of the current login name and setting the language.

3.1.1 General buttons

- ***File*** Pull-down menu with the following sub-items:
  - ***New workspace***: Deletes the entire workspace under ***User projects.***
  - ***Load projects***: Loads and opens a locally saved project under ***User projects.***
  - ***Import project***: Loads and adds a further project to the currently open project (under ***User projects***).
  - ***Save projects***: Locally saves the open project or several projects under ***User projects*** to a file (*.set); alternatively, the project can also be saved by clicking the Unsaved changes field.
  - ***Databases for safety-related values***: Importing of safety-relevant data from devices of 3rd party manufacterers in *.xml format (VDMA format).

- ***Project*** Pull-down menu with the following sub-items:
  - Creation of New IEC 62061 project.
  - Creation of New ISO 13849-1 project.
  - Creation of New safety area.
  - Creation of New safety function.
  - Creation of New subsystem or SRP/CS.
  - Export project.
  - Update product data: Products, inserted via xml database, are reconciled with the current loaded database.
- ***Copy selection***: Copies the selected component (tree node under ***Library*** or ***User projects***) to the cache
- ***Paste selection***: Pastes the component from the cache (tree node under ***User projects***)
- ***Delete selection***: Deletes the selected component (tree node under ***User projects***)
- ***Create report***: The result report of the currently selected project is created via this button
- ***Options***: Activates or de-activates the display of the product actuality in the project tree
- ***Technical Parameters:*** link to a document with safety relevant parameters of SIEMENS components.
- ***Getting Started***: Link to this document
- ***Terms***: Link to the reference "Safety Integrated, Terms and Standards"with terms and background information on the relevant standards
- ***Forum***: Link to the "Safety Evaluation Tool" online forum for questions, suggestions and additional information

3.1.2 Navigation tree

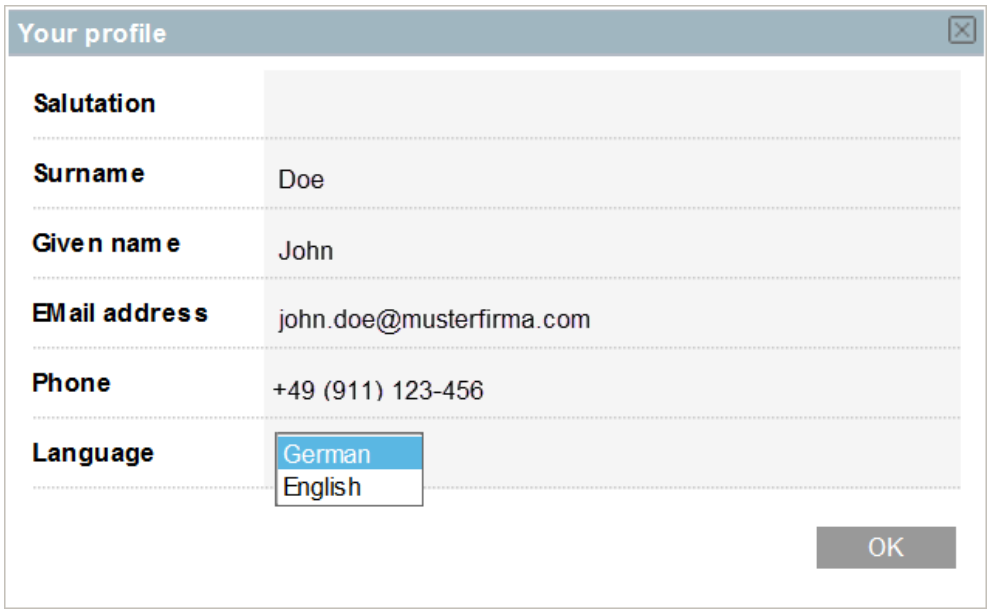
The symbols in the navigation tree have the following meaning:

- ⊞ By clicking this symbol, all elements and their sub-levels are displayed.
- ⊟ By clicking this symbol, all elements and their sub-levels are minimized.
- ▸ Further elements are available under the element, which are displayed by clicking the arrow.
- ▾ The elements available under the element are displayed; they can be minimized by clicking the arrow.
- > Lowermost level of the project.
- ⚠ Required entries are missing under the tree node.
- ⚠ The function does not meet the required SIL or PL.
- UPD Product update information is available (e.g. product can no longer be ordered). For more details, select the corresponding product.

3.1.3 Section for display of the current login name and setting the language

- Language selection of the Safety Evaluation Tools via the symbol.

Figure 3-2: Language selection (DE/EN) in SET



- User change via → Logout

3.2 Library

Typical example projects, which can be used as basis for your own projects, are available under ***Library***.

3.2.1 Inserting Safety Functions from Libraries

To insert a safety function from a library in ***User projects***, proceed as follows:

- Select the exemplary safety function in accordance with the respectively applicable standard in ***Library***.
- Operate the ***Copy selection*** button.
- Create a new project under ***User projects*** or select an existing project.
- Create a new safety area in this project or select an existing safety area.
- Select this safety area.
- Operate the ***Paste selection*** button.

3.2.2 Inserting Sub-Systems or SRP/CS from Libraries

Besides complete safety functions, also only individual sub-systems or SRP/CS can be inserted in ***User projects*** from a ***Library***. The procedure is as follows:

- Select the exemplary sub-system or SRP/CS in accordance with the applicable standard in ***Library***.
- Operate the ***Copy selection*** button.
- Create a new project under ***User projects*** or select an existing project.
- Create a new safety area in this project or select an existing safety area.
- Create a new safety function in this safety area or select an existing safety function.
- Select the respective level (DETECTION, EVALUATION or REACTION).
- Operate the ***Paste selection*** button.
- Delete the sub-system or SRP/CS, which was automatically inserted and may no longer be required after copying, in ***User projects***.

3.3 Database for safety-related values

The SET calculation tool corresponds to the new VDMA standard (standard sheet 66413) which generally provides the possibility to import data from other manufacturers into SET using the XML format.

The XML files from external manufacturers are not provided by SIEMENS. These files can, however, be imported directly via the corresponding quotations made by external manufacturers provided that the technical prerequisites are provided. SIEMENS can therefore not check the data supplied by external manufacturers for completeness, correctness and topicality. It can therefore not be excluded that some data are incorrect, incomplete, obsolete or unusable for the user.

SIEMENS does not assume any responsibility for this.

After importing the XML files, the SET Safety Evaluation Tool only evaluates the data volume in order to determine whether the structure corresponds to the VDMA standard. It is, however, not checked whether the imported data are complete, correct, topical and/or usable.

When importing product data from external manufacturers, note the manufacturer-specific information as well as any further increased due diligence in the safety-relevant area.

The following chapter describes in detail how an import of this type functions in principle.

3.3.1 Import of third-party XML files

Before importing data, the product data from the third-party manufacturer must be saved on a local drive (hard disk or network drive).

The format must be *.xml and the structure must be in compliance with the VDMA66413 specification sheet.

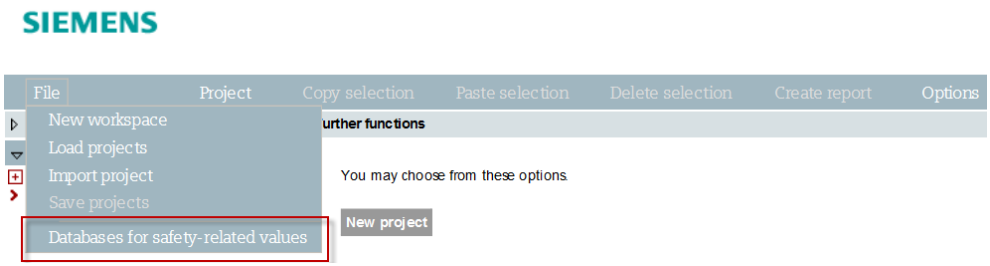
Data from safety-related products from OEM device manufacturer can then be imported directly into the Safety Evaluation Tool.

The database for safety-related values is only available during the online session. The XML file is not kept after logging off. However, third-party products already loaded from the database for safety-related values remain saved in the SET project file after logging off, assuming that the project is saved before logging off.

NOTE Please note that the data you have stored on your drive is not updated automatically. Every user is responsible for updating the imported data!

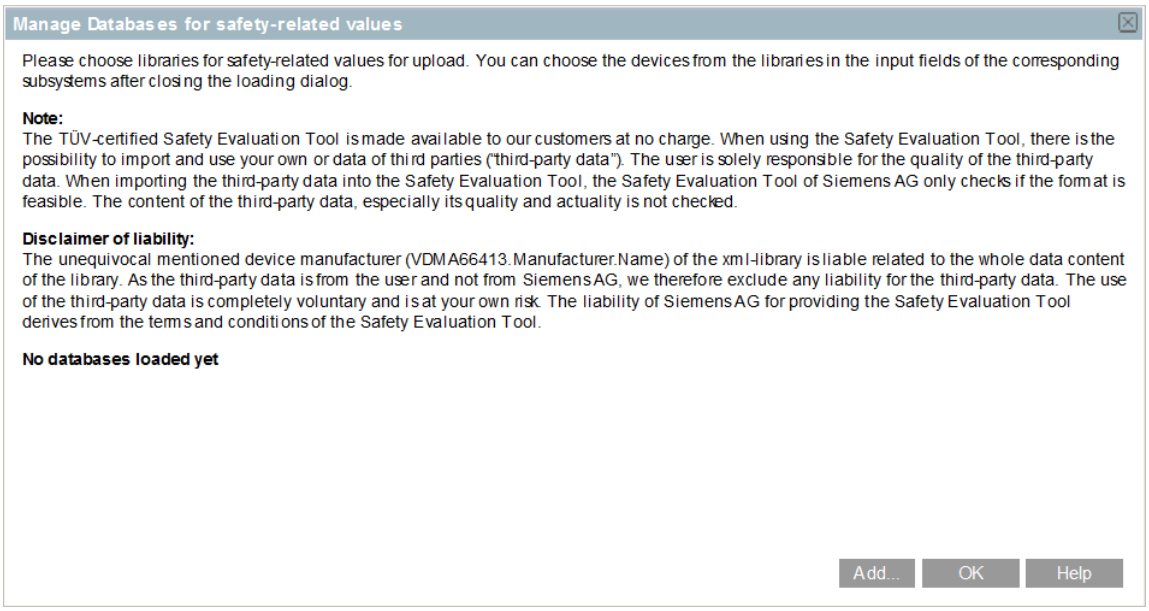
Data is imported into the SET using the "Databases for safety-related values" menu item.

Figure 3-3: Importing databases for safety-related values (*.xml format)



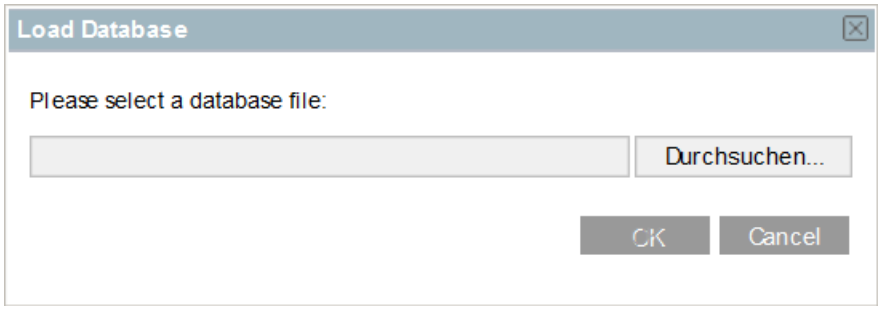
The following screen form is then displayed:

Figure 3-4: Dialog window to select a database for safety-related values



Up to 10 different parameter libraries can be simultaneously imported by clicking on the "Add..." button.

Figure 3-5: Load your third-party database for safety-related values devices

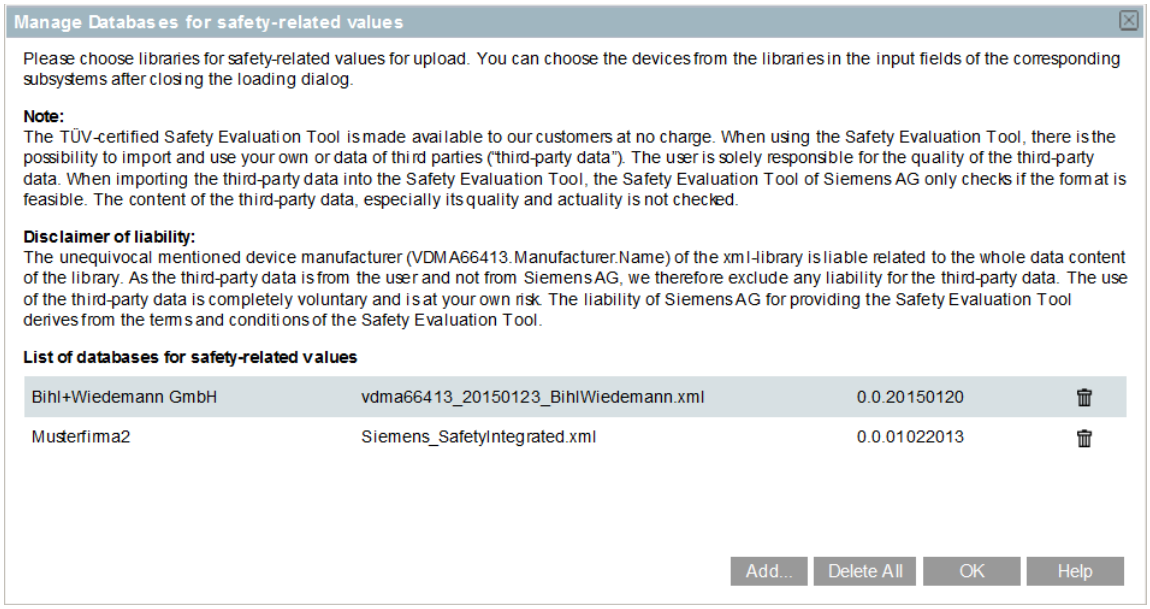


After confirming with "OK", the data is imported, and at the same time, the imported XML file is checked for consistency and the checksum.

After the check has been successfully completed, the data is imported without any additional messages. The user then has the data available to him for further processing in the Safety Evaluation Tool

An appropriate error message is displayed if the check was not successful.

Figure 3-6: Up to a maximum of 10 parameter libraries can be simultaneously selected



NOTE The SIEMENS XML library cannot be imported, as all SIEMENS device data are already included in the Safety Evaluation Tool.

Only one version of XML library is valid. More than one version of a library of one OEM device manufacturer cannot be loaded at the same time.

3.3.2 Providing SIEMENS XML file

SIEMENS is providing – as other reputable manufactures – even their safety-related product data in form of a VDMA compatible XML file for free download.

You can download the file from the following link:

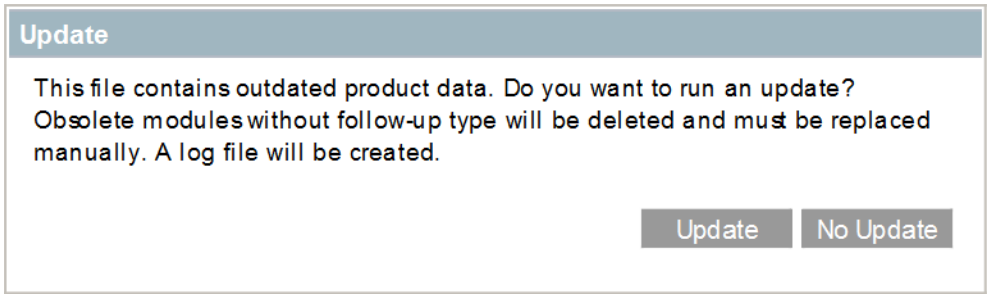
https://www.siemens.com/safety-evaluation-tool

3.4 Changes by IEC 61508 2nd Edition

Based on the changes in the IEC 61508 2nd edition, some characteristic values of the stored products have changed. If a new project is created, the characteristic values in accordance to the 2nd edition are automatically used. Changing to the 1st edition is no longer possible.

Of course, projects that have been created in accordance with IEC 61508 1st edition can still be opened with the Safety Evaluation Tool. It will be asked whether an update to the 2nd edition is to take place for all projects included.

Figure 3-7: Update dialog for projects in accordance with IEC 61508 1st edition

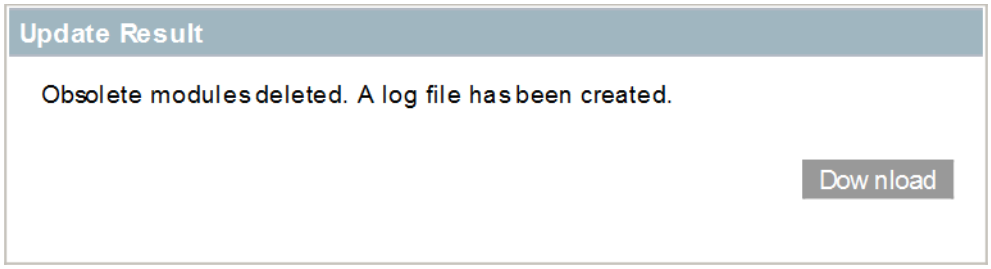


3.4.1 Updating the project to IEC 61508 2nd edition

If the dialog is confirmed with "UPDATE", all projects are set to the 2nd edition. Modules for which there are no values (outdated modules without successor type) are removed and the affected security functions are selected with a yellow warning triangle.

After the completion of the migration, a message stating whether modules have been deleted is shown.

Figure 3-8: Dialog after update to IEC 61508 2nd edition



If modules have been deleted, a log file is generated. It can be called via the Download button and includes the following information:

- Name of project
- Name of changed area
- Name of changed security function
- Product group, product name and article number per deleted module

By opening the log file the dialog is closed.

NOTE Products from the characteristic value library of third party manufacturers, as well as products that have been manufactured through the direct input of manufacturers are not updated via the update dialog. Make sure that this data is also up to date!

3.4.2 Opening project without update to IEC 61508 2nd edition

If the dialog is confirmed with "NO UPDATE", the project is loaded with the characteristic values of the 1st edition.

NOTE An update of the product data is only possible whilst the project is opened. This cannot be triggered later!

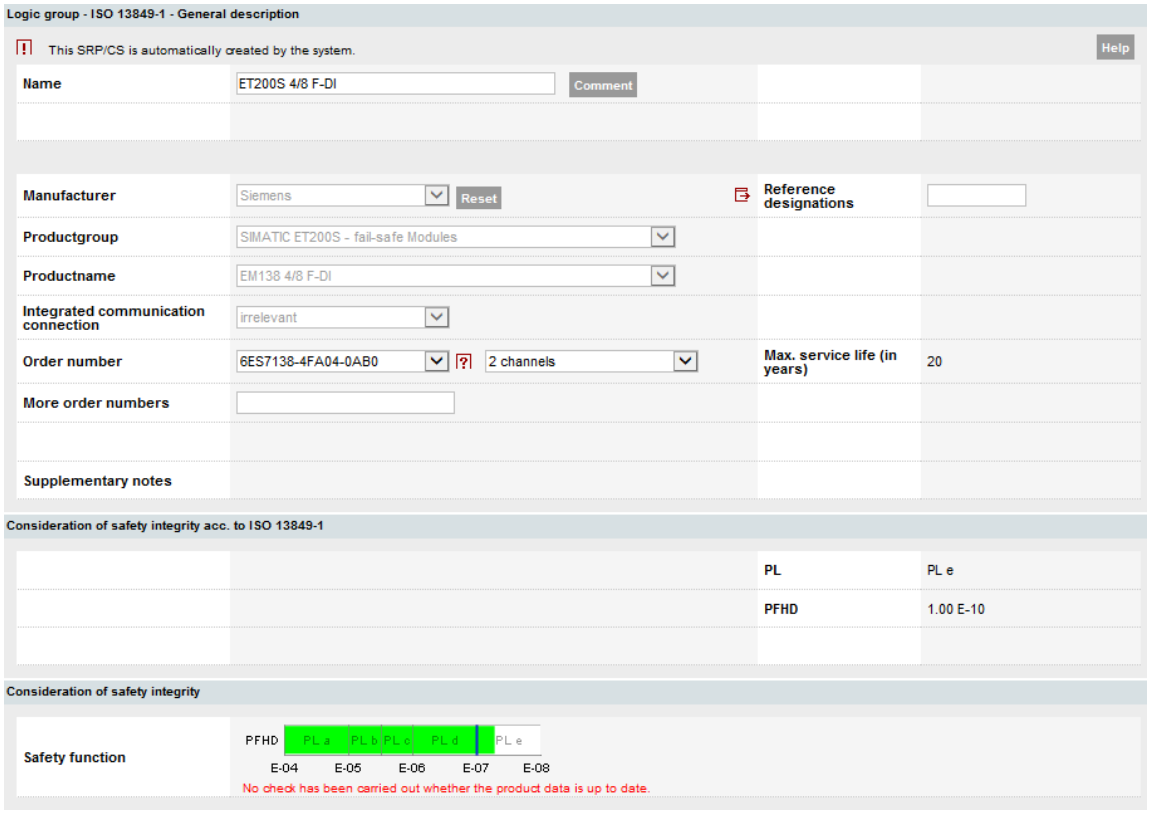
A report can be generated for the project in order to receive documentation for the existing installations. Once the report has been requested, the information that the report does no longer represent the current state of the art has to be confirmed.

Figure 3-9: Creating dialog report

NOTE The report itself does **not** mention that the characteristic values are outdated!

In the Safety Evaluation Tool a note for data of the non-migrated products is shown that indicates they can no longer be up-to-date.

Figure 3-10: Note to possibly outdated product data



For products that are to be added new to this project, the old data basis of the IEC 61508 1st edition is also used.

3.5 Creating User Projects

NOTE The locally saved file is not changed by loading, copying and deleting.

The local file (*.set) is only overwritten with the current data upon saving.

3.5.1 Loading existing projects

Already created projects can be loaded locally from a ****.set*** file (e.g. from your PC's hard disk or a company-internal server) via ***File > Load projects***. These projects can be subsequently further edited or used as basis for new projects.

3.5.2 Adding an Existing Safety Area / Function

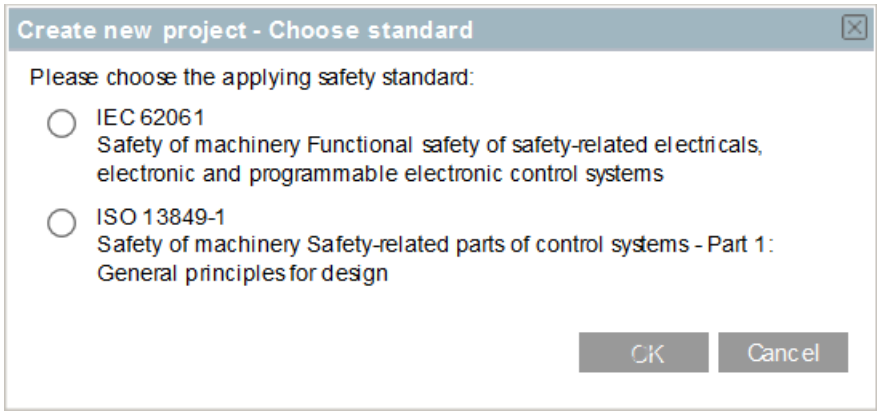
To add a safety area or a safety function from a previously created project to an open project, proceed as follows:

- Operate ***Load > Import project*** and select the respective project with the desired safety area or the desired safety function.
- After insertion of the project, select the desired safety area or safety function via ***Copy selection***.
- Insert the safety area or safety function in your project via ***Paste selection***.
- The project no longer required can be subsequently deleted via ***Delete selection***.

3.5.3 Creating a New Project

To create a new project, select ***User Projects*** and operate the New project button. Select the applicable standard for this project in the automatically opened dialog.

Figure 3-11: Create a new project, choose ISO or IEC standard

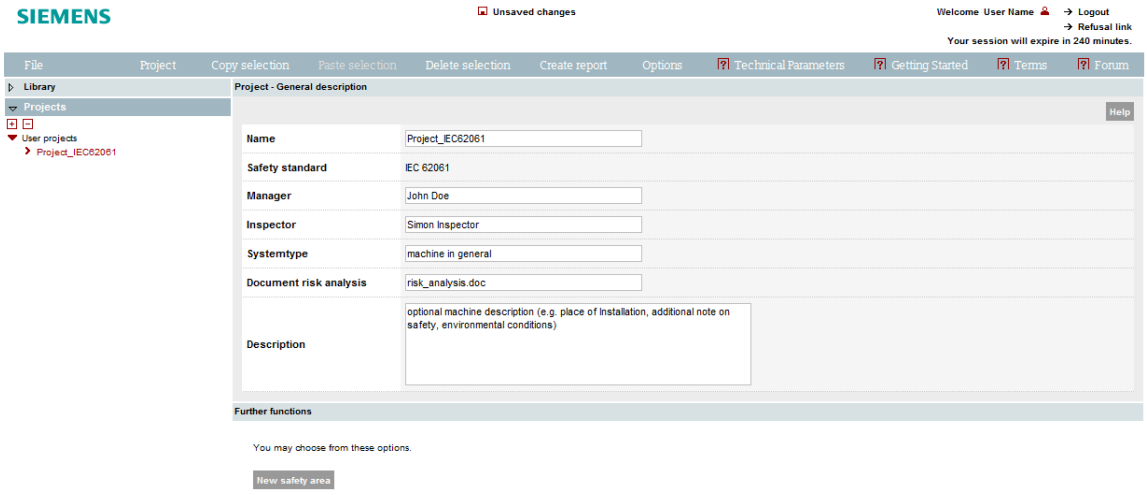


The next chapters feature a step-by-step description of the Safety Evaluation Tool's individual screens and the required entries. Screens which differ due to general differences in the standards are illustrated consecutively.

3.5.4 Project – General Description Editing

The term project refers to the summarization of one or several safety areas and safety functions of a system or machine.

Figure 3-12: General description of the project



The following information on the project has to be entered under *Project – General description*:

- ***Name*** of the project
- ***Manager*** for the project
- ***Inspector*** for the project
- ***System type***
- Name of the ***Document*** for **risk analysis**
- ***Description*** of the project

With the **Help** button you will get additional Information about the selected standard, e. g. information about the calculation of the DC value, etc.

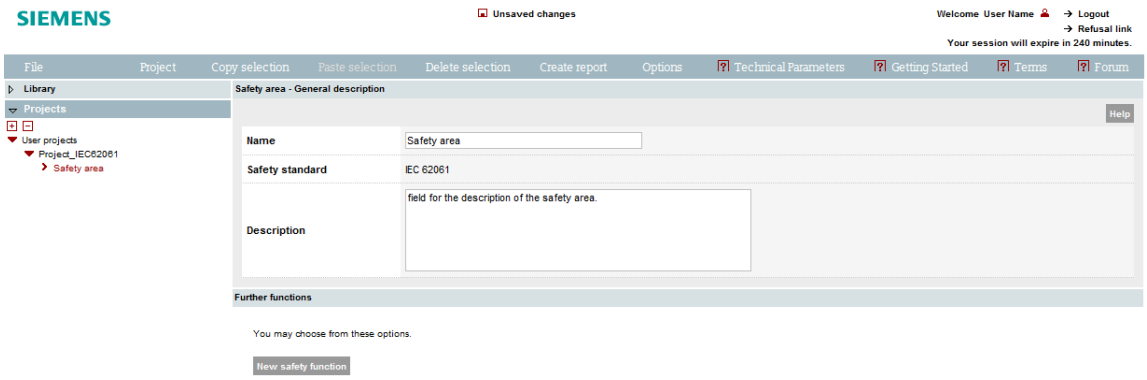
Then, operate the New safety area button under ***Further functions***.

3.5.5 Safety Area – General Description Editing

The term safety area refers to a grouping of several safety functions of a project or system. At least one safety area is required.

A safety area helps to "structure" your machine in order to assign the safety functions to specific system sections.

Figure 3-13: General description of the safety area



The following information on the safety area has to be entered under ***Safety area – General description***:

- ***Name*** of the safety area
- ***Description*** of the safety area

Then, operate the New safety function button under ***Further functions***.

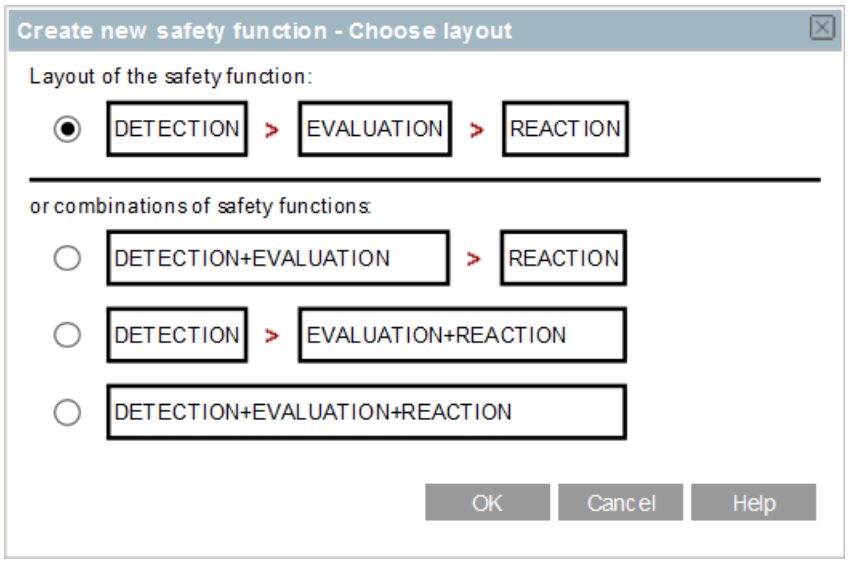
3.5.6 Creating a New Safety Function, Layout Definition

Prior to creating the safety function, the safety function layout has to be defined.

To ease further entries, the combinations below are available in addition to the standard layout of DETECTION > EVALUATION > REACTION (consisting of three sub-systems or SRP/CS):

- DETECTION+EVALUATION > REACTION With this combination, the detection and evaluation sub-functions are summarized and only devices which combine these functions are suggested to you (e.g. SIRIUS standstill monitor 3TK2810).
- DETECTION > EVALUATION+REACTION With this combination, the evaluation and reaction sub-functions are summarized and only devices which combine these functions are suggested to you (e.g. frequency converter SINAMICS G120).
- DETECTION+EVALUATION+REACTION With this combination, the three sub-functions are summarized and only devices which combine these functions are suggested to you (e.g. safety light curtain with integrated safety controller).

Figure 3-14: Create a new safety function (layout)



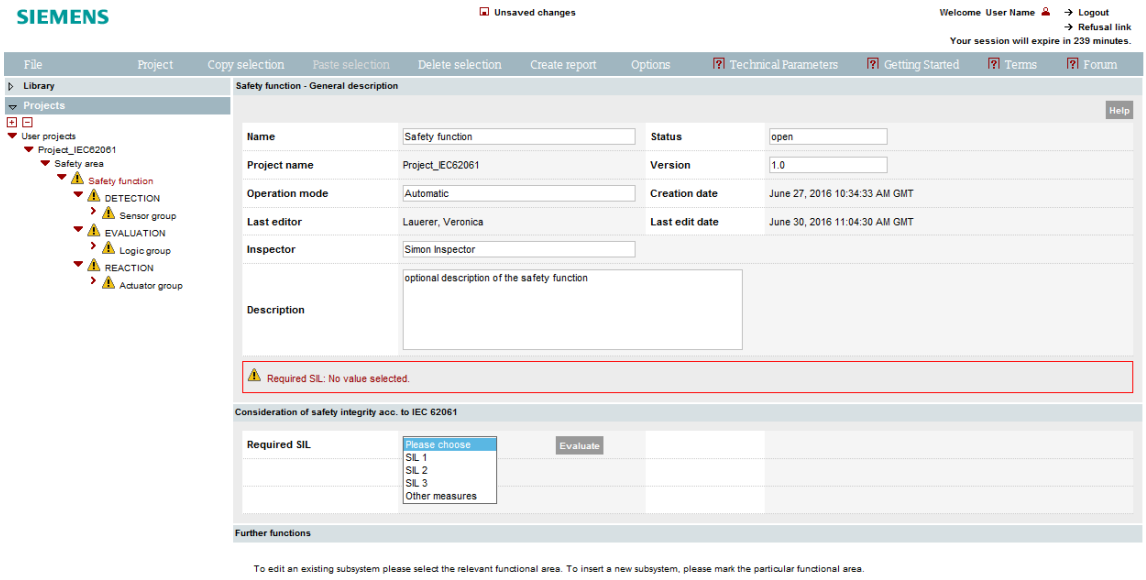
Confirm the OK selection via the button.

This Getting Started uses the default layout ***DETECTION > EVALUATION > REACTION*** for the examples of safety functions.

3.5.7 Safety Function – General Description Editing

The term safety function refers to a summarization of the individual sub-systems or SRP/CS under DETECTION, EVALUATION and REACTION.

Figure 3-15: General Safety function description (here: IEC)



The following information on the safety function has to be entered under ***Safety function – General description***:

- ***Name*** of the safety function
- ***Operation mode*** valid for this safety function
- ***Inspector*** of the safety function
- ***Description*** of the safety function
- ***Status*** of the safety function assessment
- ***Version*** of the safety function assessment

NOTE

The Last editor, who is automatically assigned upon login (first name and surname), cannot be edited.

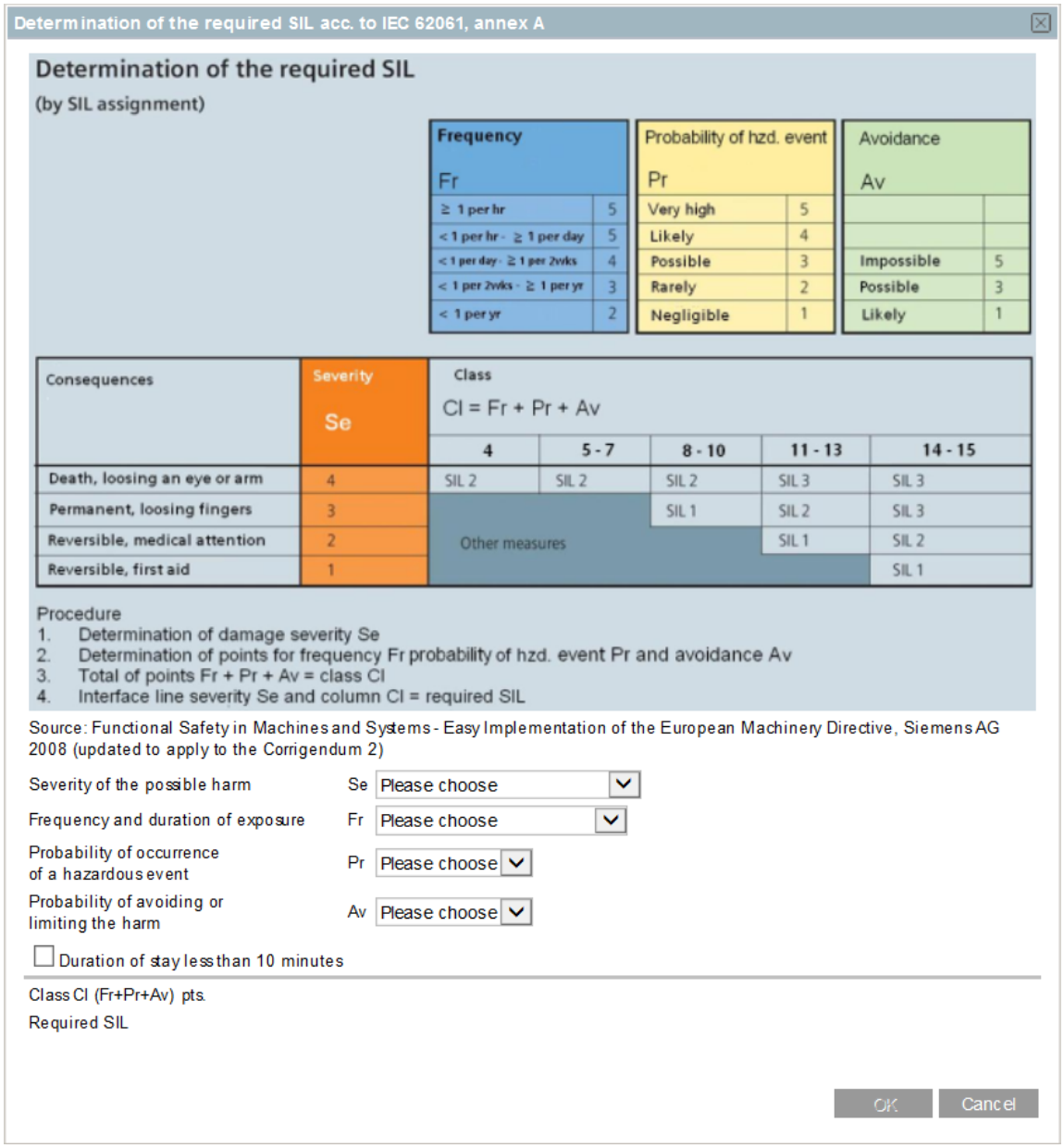
With loaded projects, the Last editor is only overwritten by the currently registered user of the Safety Evaluation Tool when project changes are saved.

The safety function safety integrity now has to be selected in accordance with the selected standard.

3.5.8 IEC 62061; Consideration of Safety Integrity

Select the ***Required SIL*** in accordance with the implemented risk analysis or determine the required SIL by operating the Find out button.

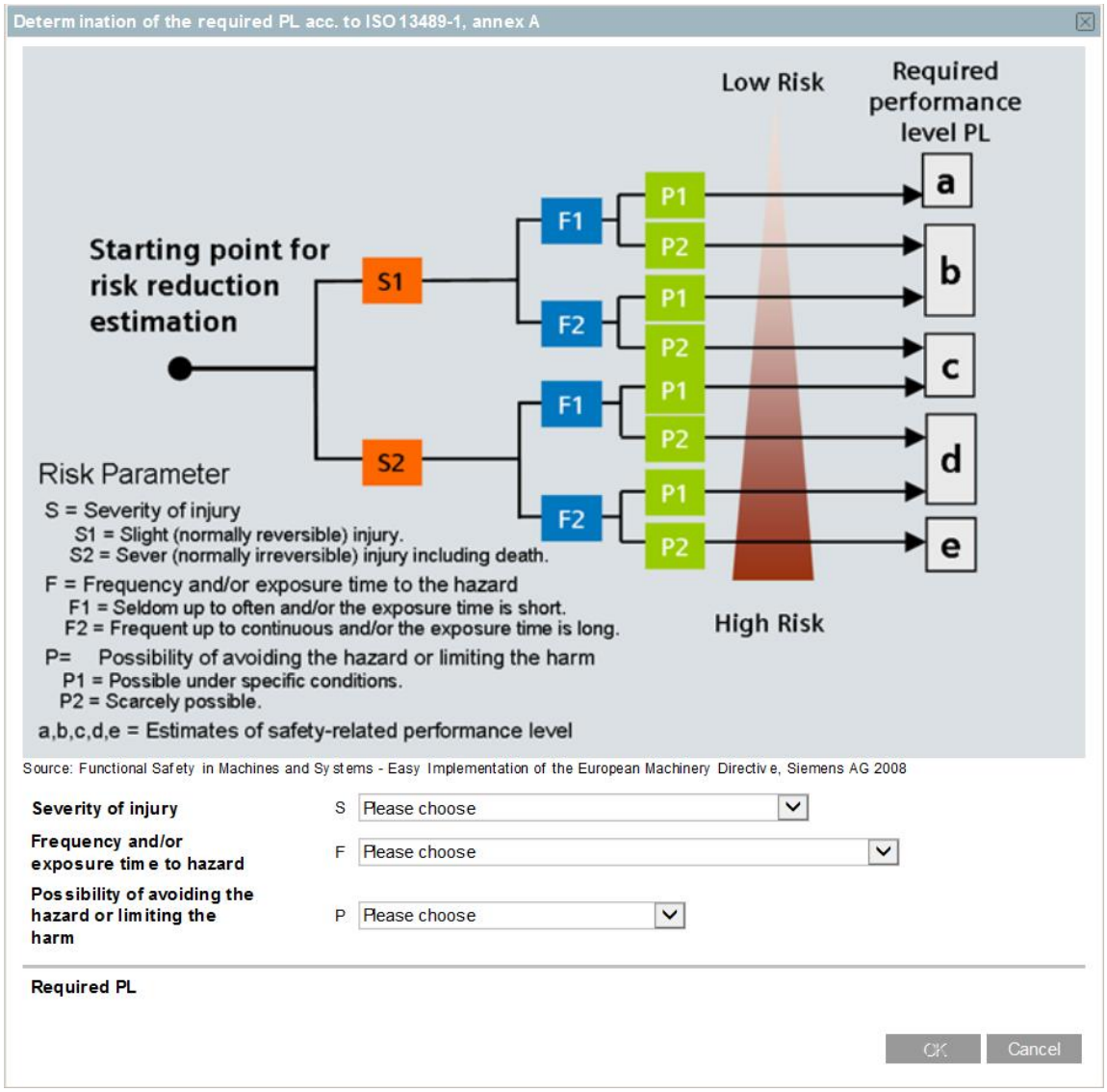
Figure 3-16: Determining the required SIL



3.5.9 ISO 13849-1; Consideration of Safety Integrity

Select the ***Required PL*** in accordance with the implemented risk analysis or determine the required PL by operating the Find out button.

Figure 3-17: Determining the required PL



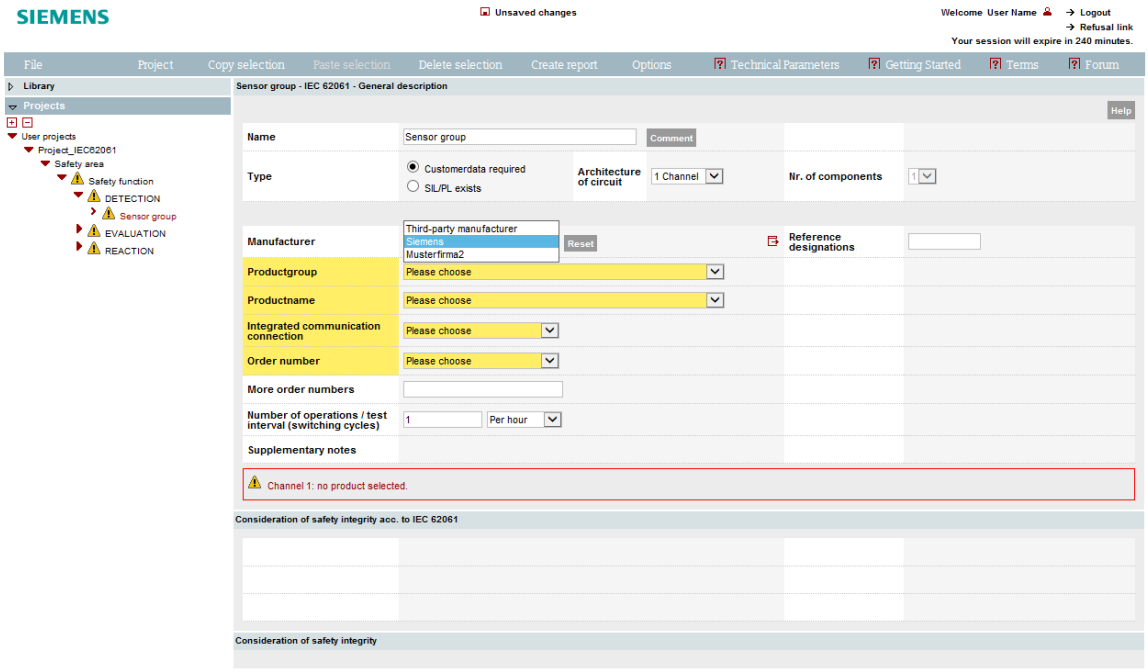
3.5.10 Sensor Group (S7 Emergency Stop Control Device) Editing

Select the ***Sensor group*** in the navigation tree under ***DETECTION***.

In this screen, the properties of the sensor (e.g. EMERGENCY-STOP (ES) command unit) for activation of the safety function have to be defined.

The screen layout and values to be entered differ depending on the used standard.

Figure 3-18: Editing Sensor Group



The general presettings of the screen are as follows:

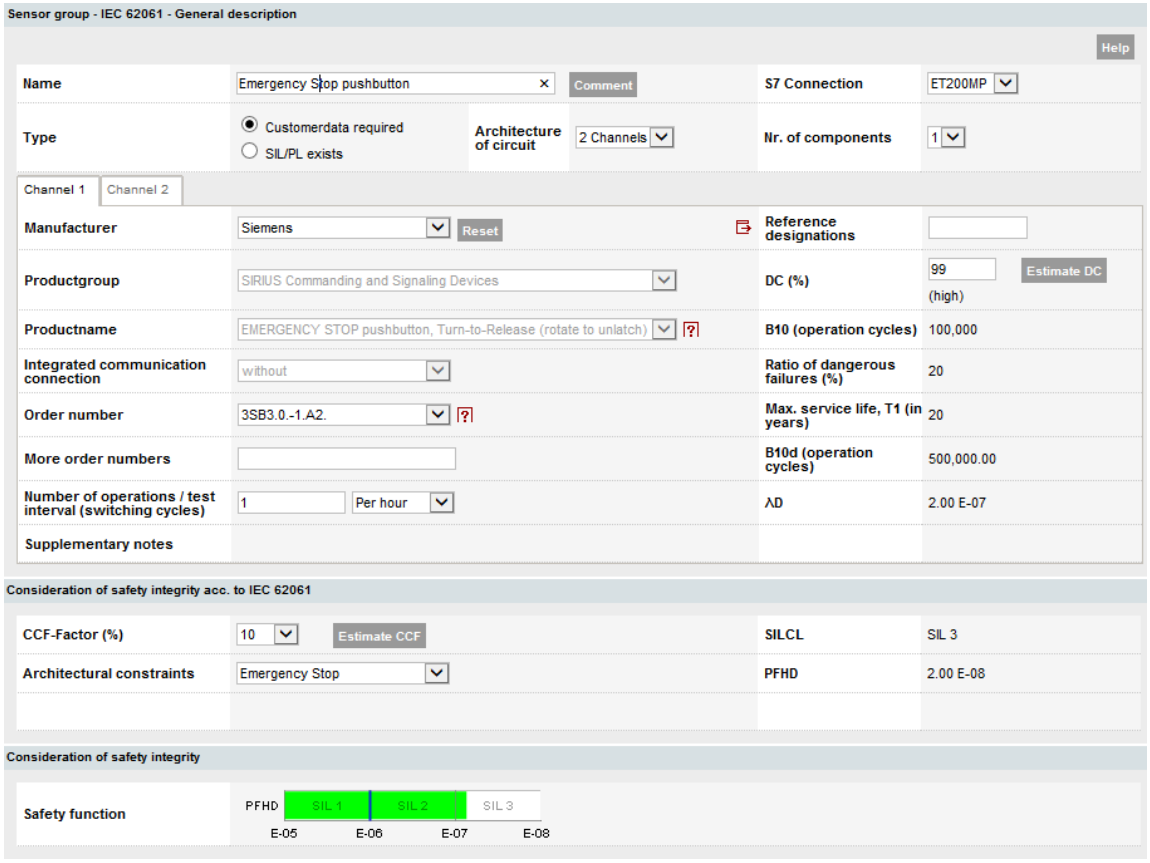
- ***Name*** of the sensor group
- ***Type*** of the sensor
  - Customer data required (wear component)
  - SIL / PL exists (electronic component)
    - When selecting ***Customer data required,*** using the pull-down menu, ***Architecture*** of the sensor group (1 or 2-channel) must be selected.
    - When selecting ***Customer data required,*** using the pull-down menu, the ***No. of components*** must be edited.
      - 1-channel architecture → 1 component
      - 2-channel architecture
        - 1 component (channels 1 and 2 are identical)
        - 2 components (identical or different types) with different values (e.g. different actuation cycle)

- ***Manufacturer*** of the sensor
  - When selecting ***SIEMENS,*** the appropriate SIEMENS sensors are recommended with the safety-relevant data.
  - When ***Third-party manufacturer*** is selected, the safety-relevant data of the sensor can be freely entered.
  - When ***Safety-related product library*** is selected, the safety-relevant data of the sensor is imported from a database for safety-related values in XML format.

The different versions are subsequently explained in detail.

Manufacturer: *SIEMENS*

Figure 3-19: Selecting SIEMENS as Sensor (e. g. Emergency Stop Pushbutton)



Complete all of the fields displayed below. Help when completing the fields is available using the tool tips for these fields and the Help button.

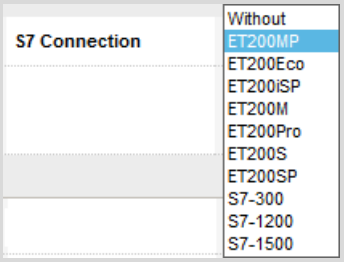
- To determine the ***DC*** and the ***CCF factor,*** the corresponding selection screen forms are available (Estimate DC or Estimate CCF button)
- ***S7 connection*** (only for sensors without ***integrated communication connection***), using this field, you can specify whether the sensor is connected to a failsafe PLC via a failsafe digital input module. When activated, under EVALUATION, a partial system and/or SRP/CS is created for the failsafe digital input module.
- ***Structural restriction*** (only for IEC 62061):
  - The selection ***Yes*** or ***Position switch*** limits the SILCL to 2
  - The selection ***None*** or ***Emergency Stop*** does not limit the SILCL
  - Also see Help

Then, in the navigation tree, under *EVALUATION*, select *S7 emergency stop control device*.

NOTE

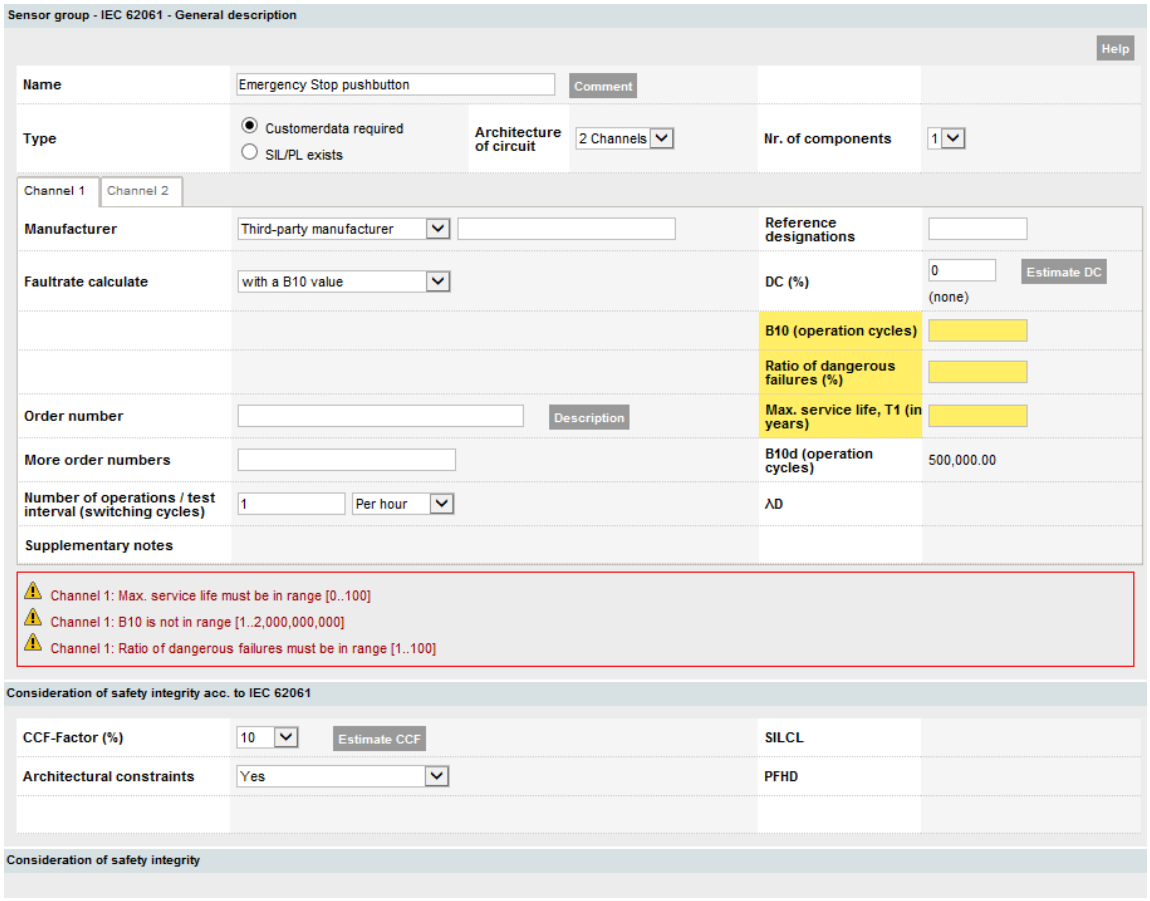
When selected "S7 Connection", you **cannot copy** the sensor group!

Instead of that, the necessary module (e.g. ET 200MP) is selected separately. In this case you will see for "S7 Connection" "Without".



Manufacturer: Third-party manufacturer

Figure 3-20: Input of sensor data via third-party manufacturer

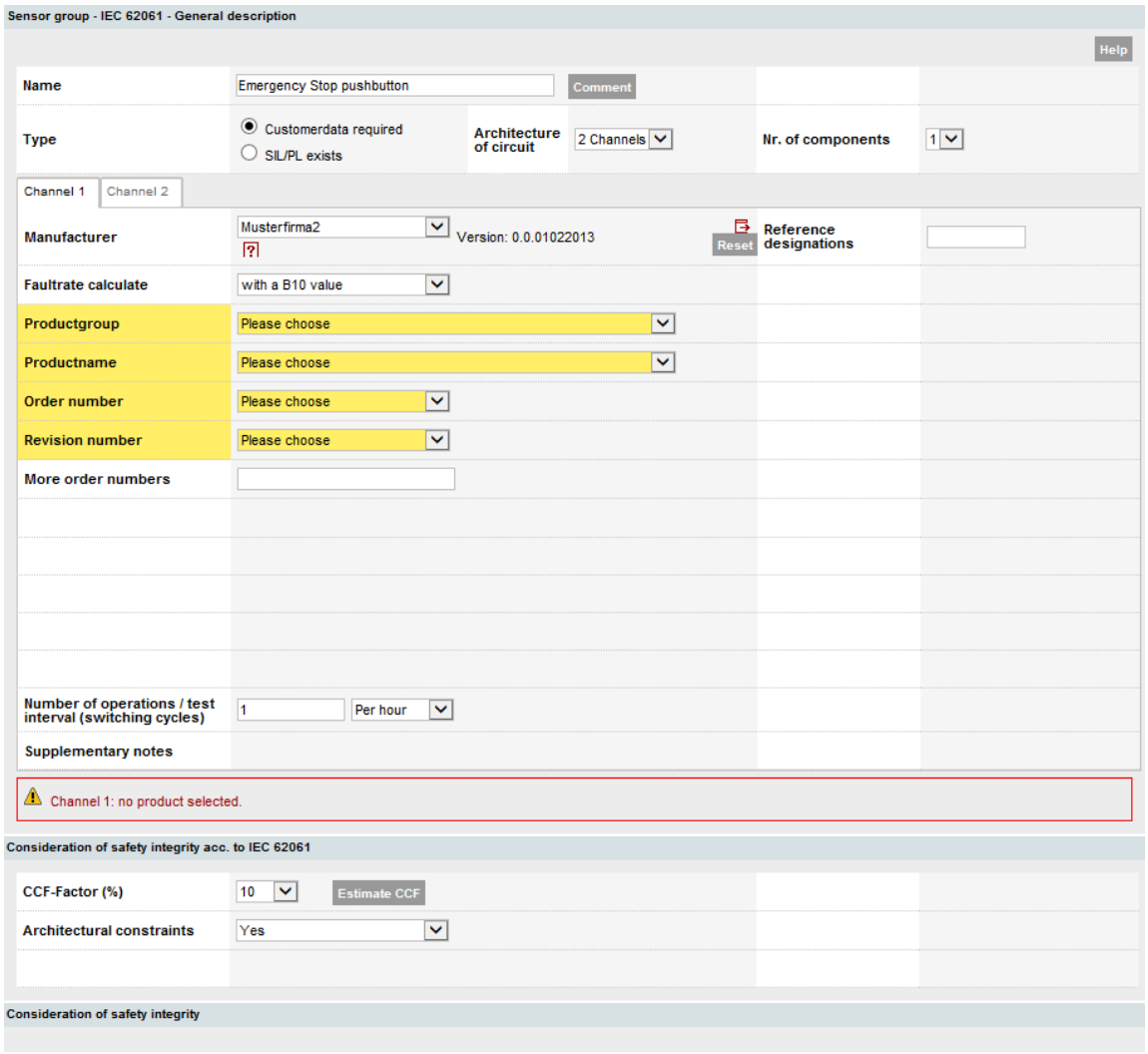


Complete all of the fields displayed below. Help when completing the fields is provided using the tool tips to the fields and the Help button. You can obtain the corresponding values from the component supplier.

- In the field next to ***Third-party manufacturer,*** enter the manufacturer's name
- Under ***Fault rate calculate*** you can select which value should be used to calculate the fault rate. The fault rate can be calculated using:
  - B10
  - B10d
  - MTTF
  - MTTFd
  - MTBF
  - λD
- To determine the ***DC*** and the ***CCF Factor,*** the corresponding selection screen forms are available (Estimate DC or Estimate CCF button)
- ***Structural restriction*** (only for IEC 62061):
  - The selection ***Yes*** or ***Position switch*** limits the SILCL to 2
  - The selection ***None*** or ***Emergency Stop*** does not limit the SILCL
  - Also see Help

Manufacturer: OEM device selection by XML import

Figure 3-21: Sensor integration via XML product import (e. g. "Musterfirma2")



If you have imported a XML file with safety-related product values from your external device manufacturer you can choose your safety sensor product directly. Please follow the instruction of the device manufacturer for any selection criteria!

Do the same settings, as in the description before, for the relevant parameters (e. g. test intervals, ratio, CCF, etc.) respectively the selection criteria to reach the required safety category.

NOTE

Consider the product information from your OEM device manufacture!

Please note that the SET does not check whether the data imported from external manufacturers are complete, correct, topical and/or usable.

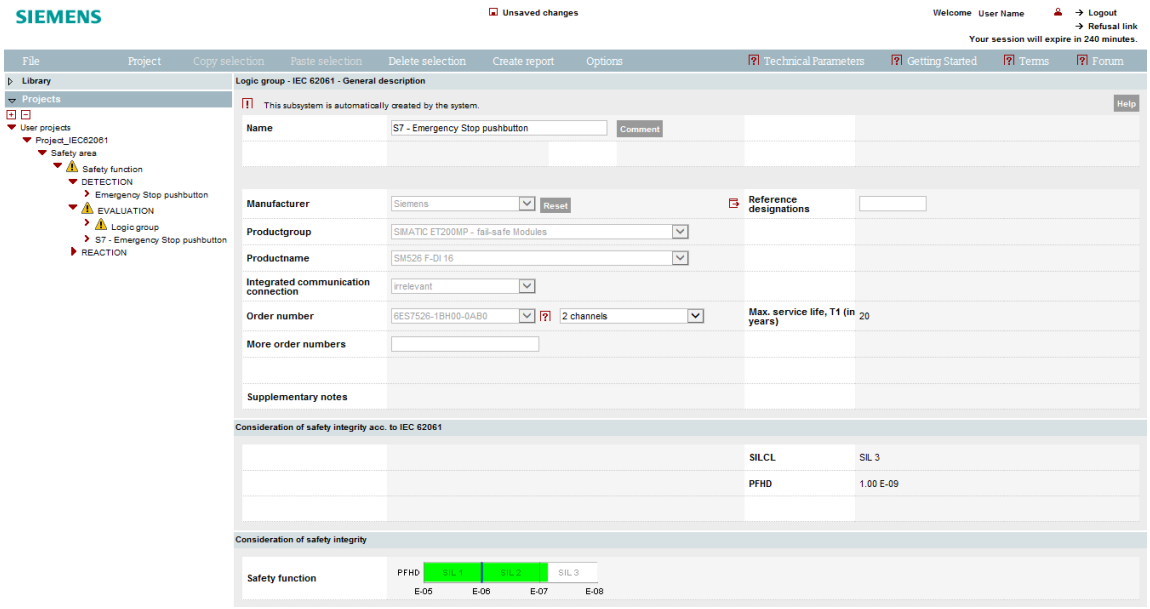
3.5.11 Logic Group (S7 Emergency Stop Control Device) Editing

Select EVALUATION in the navigation tree.

Due to selection of the ***S7 connection*** in the *Sensor group*, a sub-system or SRP/CS was automatically created for the failsafe digital input module "S7 Emergency Stop Control Device" under **EVALUATION** group.

The screen layout and values to be entered differ depending on the used standard.

Figure 3-22: Evaluation with F-DI16 (from S7 Connection, ET 200MP, SM526, F-DI16)



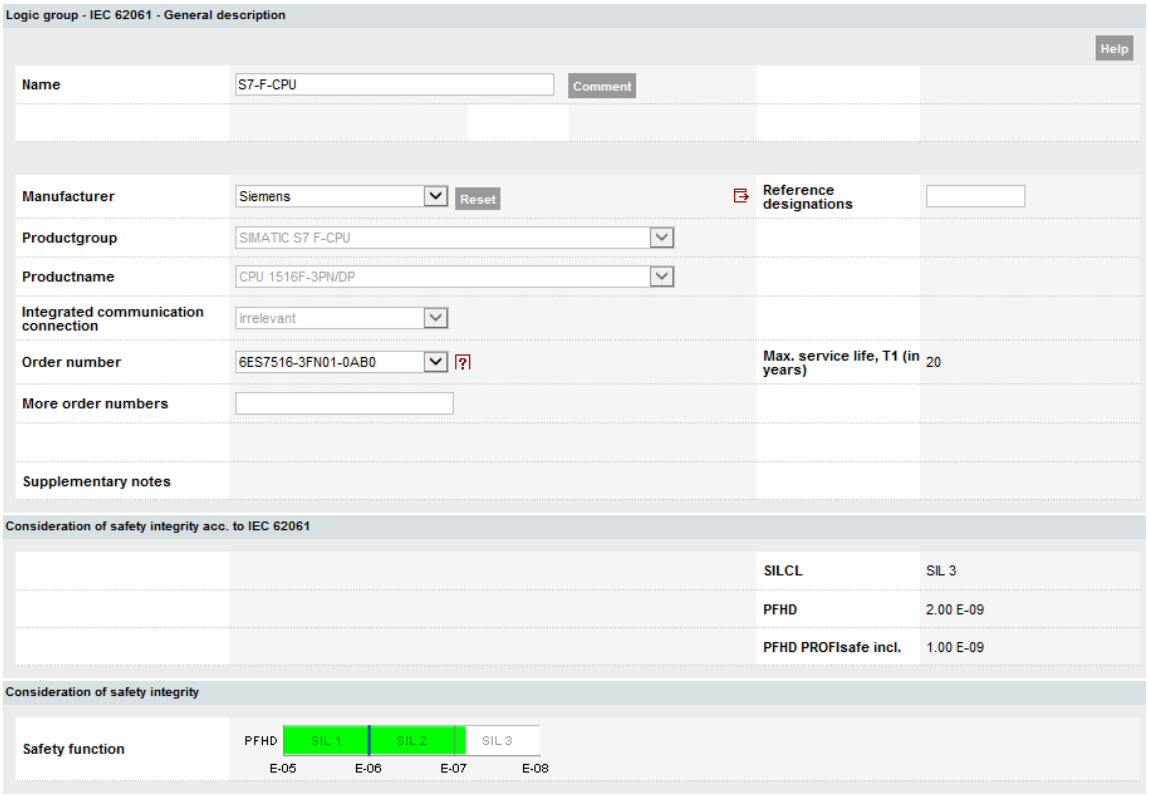
Fill in all fields. Help is provided by the tool tips on the fields and via the Help button.

3.5.12 Logic Group (S7 Controller) Editing

Select the ***Logic group*** in the navigation tree under ***EVALUATION***. In this screen, the properties of the safety function evaluation logic (e.g. safety relay, failsafe CPU) have to be defined.

The screen layout and values to be entered differ depending on the used standard.

Figure 3-23: Editing the S7 CPU Logic Controller (e. g. S7 F-CPU, CPU1516F-3PN/DP)



The general pre-settings of the screen are as follows:

- ***Name*** of the logic group
- ***Manufacturer*** of the evaluation logic
  - When **SIEMENS** is selected, the corresponding SIEMENS evaluation units (e. g. S7-CPU, MSS, 3RK12, etc.) are recommended with the safety-relevant data.
  - When ***Third-party manufacturer*** is selected, the safety-relevant data of the evaluation logic can be freely entered. Details on ***Third-party manufacturer*** are provided in chapter 3.5.10.
  - When ***OEM device Manufacturer*** is selected, the safety logic controller is inserted via XML file import (VDMA format) form a OEM device manufacturer.

Next, fill in all fields. Help is provided by the tool tips on the fields and via the Help button.

3.5.13 Actuator Group (Drive) Editing

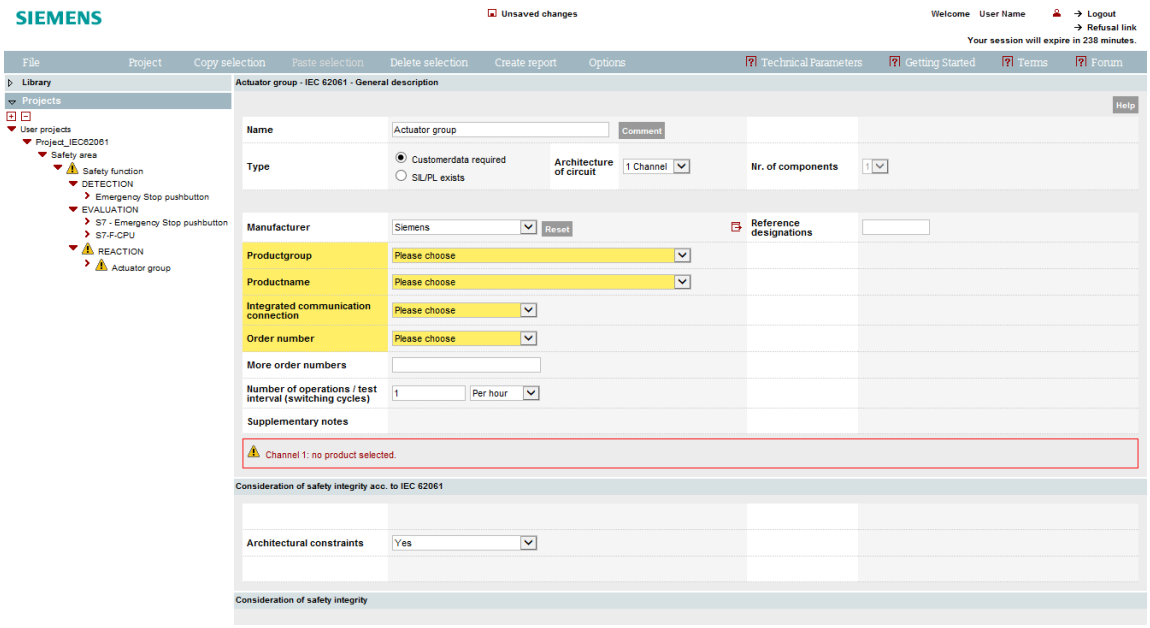
Overview

Select the ***Actuator group*** in the navigation tree under ***REACTION***.

In this screen, the properties of the safety function actuator (e.g. line contactor, failsafe drive) have to be defined.

The screen layout and values to be entered differ depending on the used standard.

Figure 3-24: General description of Actuator group, create subsystem



The general pre-settings of the screen are as follows:

- ***Name*** of the actuator group
- ***Type*** of the actuator
  - ***Customer data required*** (electromechanical component)
  - ***SIL / PL exists*** (electronic component)
- ***Manufacturer*** of the actuator
  - When ***SIEMENS*** is selected, the corresponding SIEMENS actuators with the safety-relevant data are recommended.
  - When ***Third-party manufacturer*** is selected, the safety-relevant data of the actuator can be freely entered. Details on ***Third-party manufacturer*** are provided in chapter 3.5.10.
  - When ***OEM device manufacturer*** is selected, the safety logic controller is inserted via XML file import (VDMA format) form a OEM device manufacturer.
- ***S7 connection*** (only with actuators without ***integrated communication connection***). In this field, you can state whether the actuator shall be connected to a failsafe PLC via a failsafe digital output module. When activating the field, a subsystem resp. SRP/CS is automatically created for the failsafe digital output module during the evaluation.

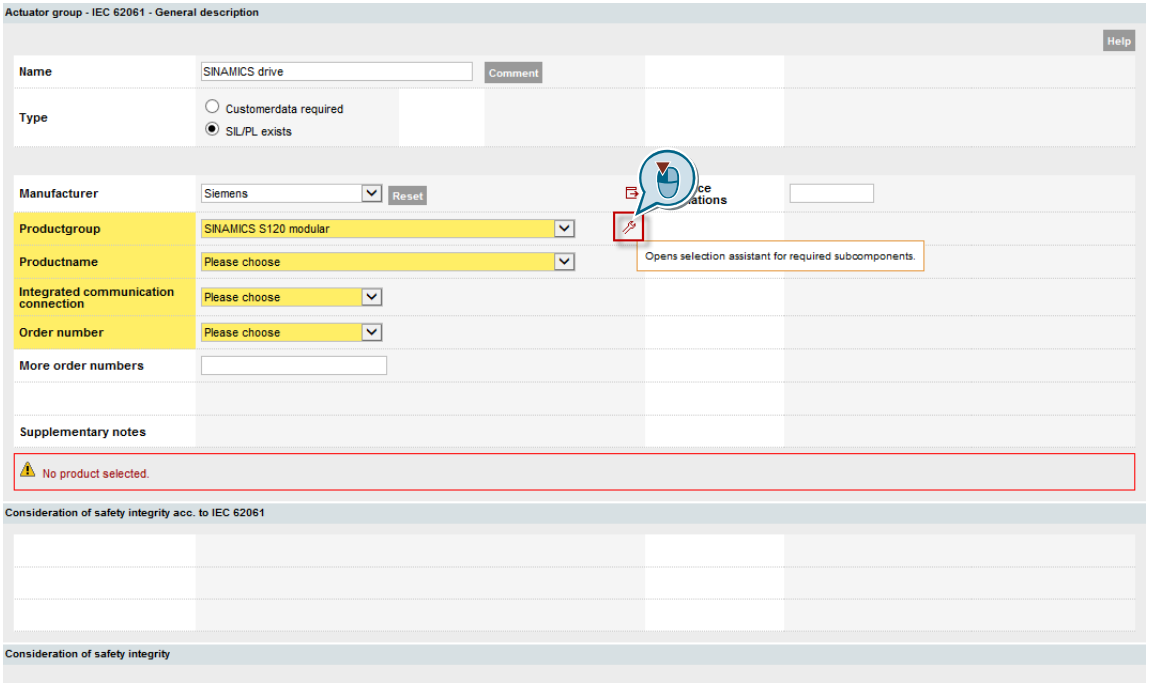
Next, fill in all fields. Help is provided by the tool tips on the fields and via the Help button.

Selection assistant

For the modular failsafe drive systems SINAMICS S110, SINAMICS S120 AC/AC and SINAMICS S120 modular, a selection assistant is available, which supports you when selecting safety- relevant components. It goes without saying that the required components can also be directly selected as before.

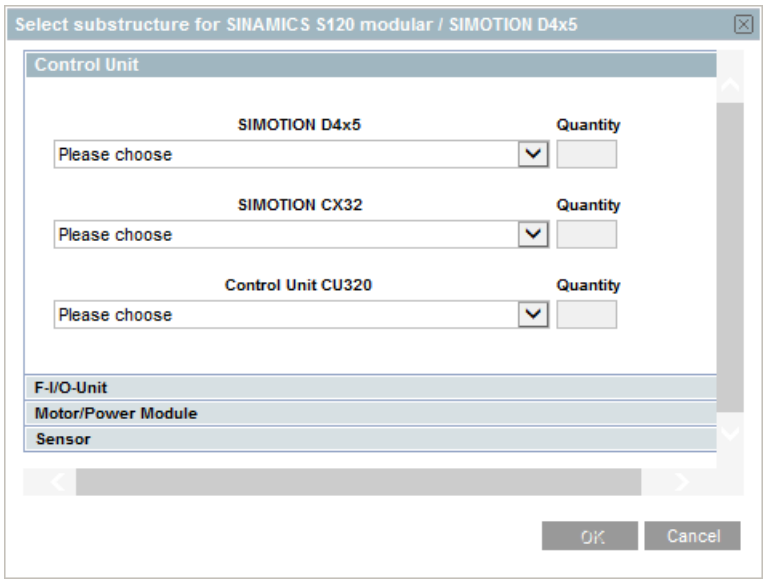
The selection assistant is opened by clicking on the symbol  .

Figure 3-25: Opening the drive selection assistant



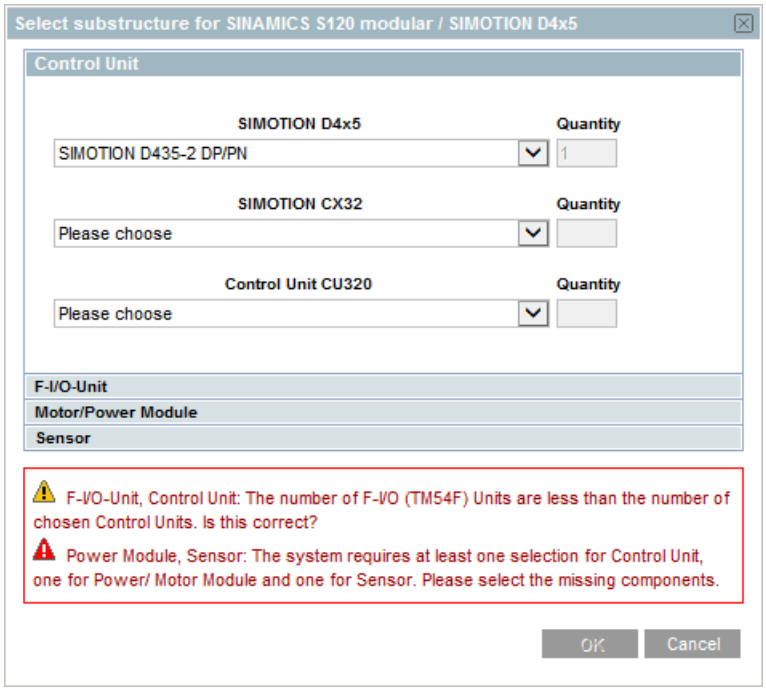
The dialog that is now displayed allows a structured selection of the relevant system components. Please note that when opening the dialog again, the previously entered information is no longer available.

Figure 3-26: Setting the drive selection assistant



The dialog also checks whether all of the required system components have been selected. As long as this is not the case, the following message is displayed, and the system prevents the dialog from being exited.

Figure 3-27: Failure Message from Drive Selection assistant dialog

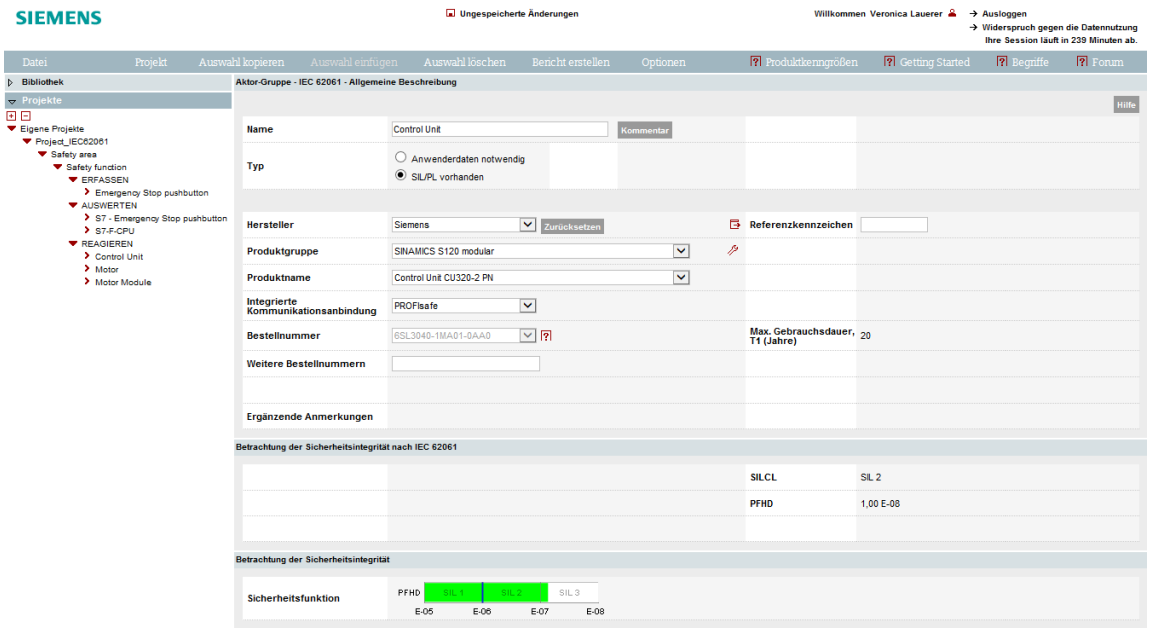


As soon as the selection has been completed, after pressing the OK button the dialog is closed and the selected components appear in the project tree below ***REACTION***.

Under ***NAME*** now allocate the appropriate designations for the automatically inserted partial systems and/or SRP/CS corresponding to your particular system or machine – and then complete the entries by editing the fields in yellow with the "Please choose" text.

No Selection assistant is provided for the integration of an actuator from an external manufacturer. Integrate the safety-related actuator of an XML parameter library just like an external sensor or an external logic unit.

Figure 3-28: Complete REACTION part (created with drive selection assistant)



NOTE

The Safety Integrated Basic Functions of the drives do not require an encoder. In this case, for encoder system you must select "No encoder required". This selection only serves to complete the check. As a consequence, after exiting the dialog, an SRP/CS is not created.

On the other hand, selecting "Sensorless motion monitoring" simultaneously includes a PFH value. After exiting the dialog, a partial system or SRP/CS is created for this purpose.

The selection assistant for SINAMICS S120 modular includes basic plausibility checks, e.g. whether the number of selected encoder systems matches the number of Motor/Power Modules.

It cannot replace the **SIZER** engineering tool in which the complete system knowledge is saved.

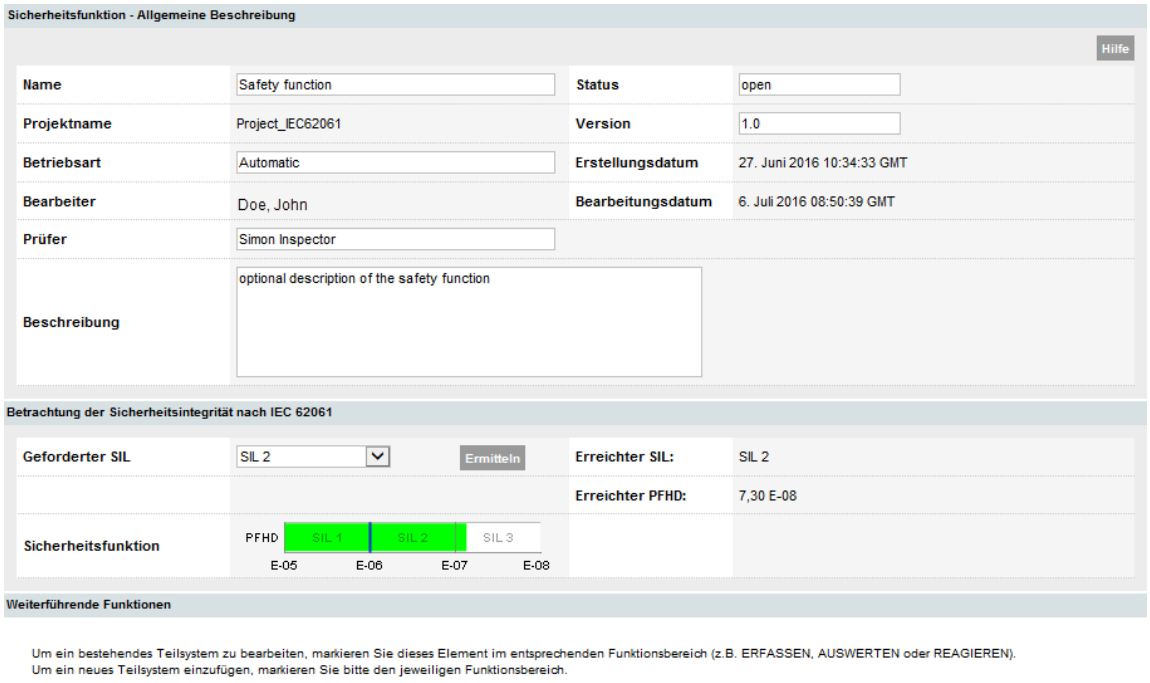
3.5.14 Result

Then, select the safety function level in the navigation tree for display of the calculation result.

The result of the safety integrity consideration is displayed in the overview screen of the safety function, in the form of the ***Achieved SIL or PL*** and ***Achieved PFH_D***.

The screen layout red differs depending on the used standard.

Figure 3-29: Final Actuator Group (made with Drive Selection assistant)



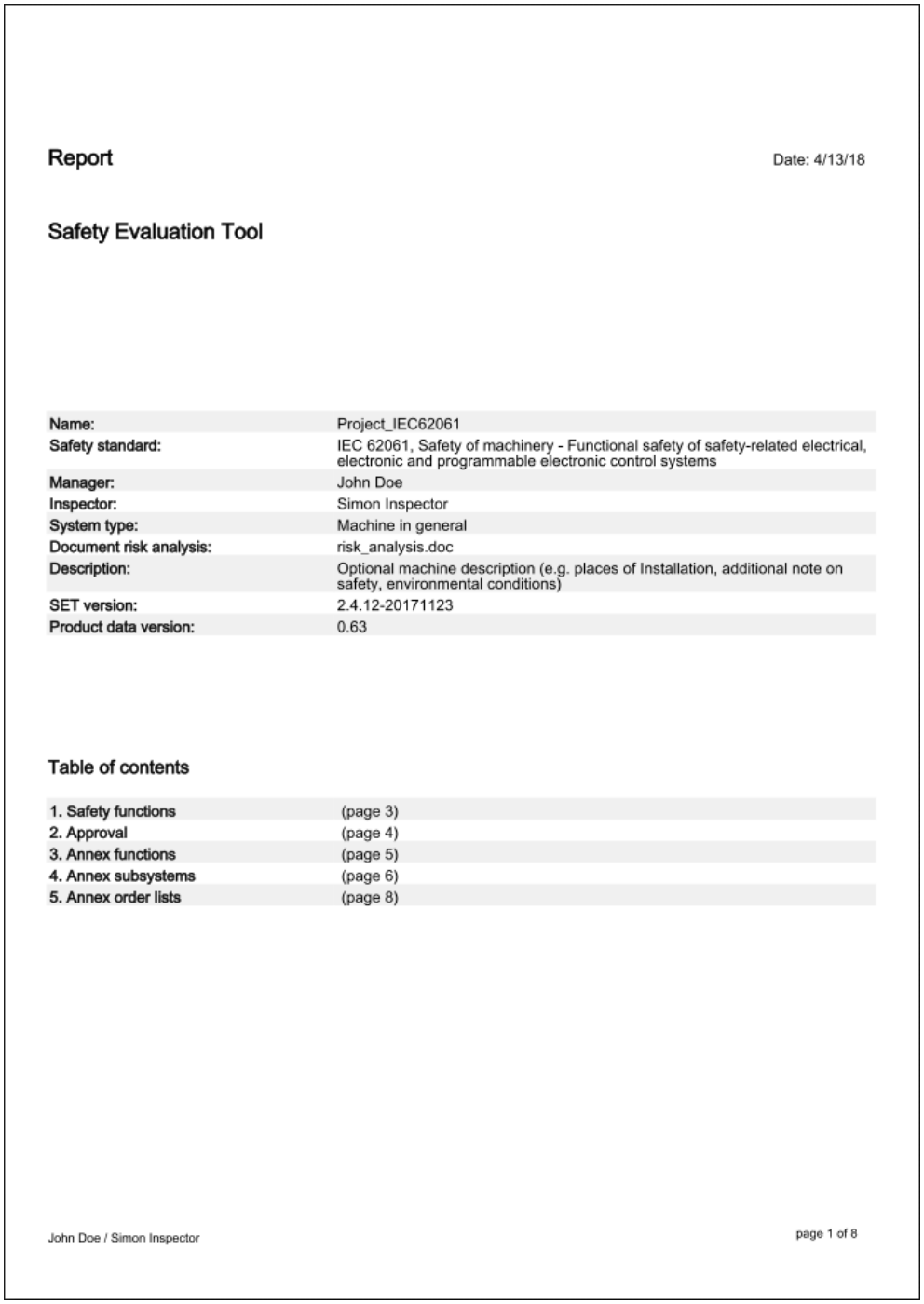
NOTE In the screens, the calculation results are only displayed with two decimal places.

However, the Safety Evaluation Tool internally uses more than two decimal places.

3.5.15 Create Report

To generate the result report, select the respective project in the navigation tree and select the ***Create report*** button.

Figure 3-30: Report out of Safety Evaluation Tool



Report Date: 4/13/18

Safety Evaluation Tool

Name:	Project_IEC62061
Safety standard:	IEC 62061, Safety of machinery - Functional safety of safety-related electrical, electronic and programmable electronic control systems
Manager:	John Doe
Inspector:	Simon Inspector
System type:	Machine in general
Document risk analysis:	risk_analysis.doc
Description:	Optional machine description (e.g. places of Installation, additional note on safety, environmental conditions)
SET version:	2.4.12-20171123
Product data version:	0.63

Table of contents

The signed report should be added to the Technical Documentation of the machine/system as confirmation.

4 Appendix

4.1 Links and literature

Table 4-1

Nr.	Topic
\1\	Safety Evaluation Tool www.siemens.com/safety-evaluation-tool
\2\	Safety Integrated website www.siemens.com/safety-integrated
\3\	SIEMENS XML product file http://www.industry.siemens.com/topics/global/en/safety-integrated/machine-safety/safety-evaluation-tool/Pages/default.aspx?tabcardname=data%20interface
\4\	Functional Safety of Machines and Systems Order No.: A19100-L531-B123 (can be ordered via your SIEMENS contact partner)

4.2 History

Table 4-2

Version	Date	Änderung
V1.0	04/2009	First issue
V2.0	06/2011	Update for SET V2.0
V2.1	11/2013	Amendment XML safety-related product data import (neutral data interface) function
V2.2	04/2018	Revision for Safety Evaluation Tool 2.4.5 Layout update