

IQ Risk Management Tools

Version 5.1

Manual

APIS Informationstechnologien GmbH

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2. Edition, January 2006

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Introduction

Welcome to the ***APIS IQ-RM Tools*** (RM = Risk Management), the software for Quality Assurance and Risk Analysis (Risk Management), Requirement Management, Operational Readiness Management (ORM, Ready Status Management) and 6-Sigma Scorecard.

The family of ***APIS IQ-RM Tools*** (APIS IQ-Software for short) covers two lines: the ***APIS Server Software*** and the ***APIS Client Software***.

The APIS Server Software expects that a Server exists, on which the ***APIS CARM Server*** software can be installed. Depending upon the stage of development this Server can make the following Services available (CSS = CARM Server service), e.g.

- ***APIS CSS Standard***
- ***APIS CSS Module***
- ***APIS CSS Action Tracking***

The handling of the Server and the individual Services are described in a separate manual.

The APIS Client software can be acquired with different levels of functionality. These are:

- ***APIS IQ-FMEA***
- ***APIS IQ-FMEA-L***
- ***APIS IQ-FMEA PRO***
- ***APIS IQ-RM***
- ***APIS IQ-RM PRO***
- ***APIS IQ-RM-X***

This manual describes the extent of ***APIS IQ-RM-X*** since this Version covers the functionality of all the different products. The function range of the individual products is represented in the following table.

Function	IQ-FMEA	IQ-FMEA-L	IQ-FMEA PRO	IQ-RM	IQ-RM PRO	IQ-RM-X
Customer Requirements			✓		✓	✓
Customer Requirement Management			✓		✓	✓
Structure Tree	✓	✓	✓	✓	✓	✓
Process Flow Diagram (QS-9000)				✓	✓	✓
Control Plan (QS-9000)				✓	✓	✓
Function and Failure Analysis	✓	✓	✓	✓	✓	✓
Function Nets	✓	✓	✓	✓	✓	✓
Failure Nets / Fault Trees	✓	✓	✓	✓	✓	✓
FMEA Form (QS-9000)	✓	✓	✓	✓	✓	✓
FMEA Form (VDA, Mil, etc.)	✓	✓	✓	✓	✓	✓
DRBFM Support	✓	✓	✓	✓	✓	✓
Deadline Editor	✓	✓	✓	✓	✓	✓
Statistics (Pareto, etc.)	✓	✓	✓	✓	✓	✓
Object Inspector	✓	✓	✓	✓	✓	✓
Object Comparer	✓	✓	✓	✓	✓	✓
User view	✓	✓	✓	✓	✓	✓
Named User View			✓		✓	✓
Simultaneous Engineering (2 documents)			✓		✓	✓
Simultaneous Engineering (n documents)						✓
CBT ³⁾ including standard unit	✓	✓	✓	✓	✓	✓
Team Communication (E-mail, Internet)	✓	✓	✓	✓	✓	✓
Terminology/Translation	✓	✓	✓	✓	✓	✓
Fault Tree Calculation	✓	✓	✓	✓	✓	✓
Multilingual Documents		✓	✓	✓	✓	✓
Cause and Effect Diagram (Ishikawa	✓	✓	✓	✓	✓	✓

Six-Sigma (Scorecard / Transfer Function)						✓
ORM-Editor						✓
CARM Server interface	✓	✓	✓	✓	✓	✓

APIS IQ-RM Tools (Risk Management Tools) optimally support the users with work within the scope of Risk Management (FMEA, Process Flow Diagram, Control Plan). The redundancy-free handling of data makes consistent, efficient changes possible in different documents without additional adjustments.

The software is adapted and optimised for the Windows environment and offers a safe basis for integrated Workflow and Document Management Systems. To date, all expectations of re-use of the documented knowledge have been fulfilled.

Minimum System Requirements

In order to be able to use the *APIS IQ-RM Tools*, certain hardware and software components are required:

- PC with at least a “Pentium” processor
- Microsoft Windows 95, Windows 98, Windows ME, Windows NT 4.0, Windows 2000 or Windows XP (IA 32)
- Hard drive with 15 MB free space
- CD ROM drive

128 MB RAM and a screen resolution of at least 1024 x 768 pixels is recommended.

Installation

When installing IQ-RM-X, there are differences between an installation of a single user version compared to a network version. The substantial differences are:

- A **single user version** can be installed only on the local drive of your computer. However, it is possible to store data in a network drive.
- With a **network version**, both the data and the program can be put on any drive (local or network). Normally, if several users are networked together, and are intended to work with the IQ-Risk Management Tool, then the network version is most appropriate. The program must be installed only once in the net and is nevertheless – within the constraints

of the maximum number of active users – accessible by several users at the same time. That saves on disk space and work – particularly with the actualisation and care of the installed program, e.g. if service packs or updates are installed or functionality becomes extended.

However, the first steps of the installation are always the same.

First steps for a single user and/or a network installation

The program files for the *APIS IQ-RM Tools* must be installed from CD ROM, since using the *APIS IQ-RM Tools* directly from the CD is not possible. If an earlier version is installed on your computer already (e.g. APIS IQ-FMEA 5.0), then a new directory should be selected for the installation of the current version.

After inserting the CD, the installation program for the *APIS IQ-RM Tools* is run automatically, as long as the “Auto-Run” feature is activated. If this is not the case, then the installation may be started manually by activating the file `SETUP.EXE` that is on the CD e.g. by double-clicking on the file in Windows Explorer.

TIP: The necessary access rights must be defined within the operating system to be able to implement the installation. With Windows NT operating systems (NT 4.0, Windows 2000, Windows XP), it must be ensured that the current user has ‘write’ access rights for the `DATA` directory (referred to later on this manual).

To continue with the installation procedure, the installation instructions must be followed to install the program files and the selected components.

For a single user installations, the Start menu of Windows will display the entry “APIS Tools” under “Programs”.

Additional steps to be followed for a network licence:

The network version of the *APIS IQ-RM Tools* runs with common network software packages (Novell, Microsoft Windows Server Service and all CIFS compatible services...). The network software package permits the simultaneous usage of the *APIS IQ-RM Tools* up to the maximum number of active users, and does not depend upon which workstation the software is run from.

The *APIS IQ-RM Tools* are installed in the directory (program directory) on the network server, as in the previous section “first steps for installation...”

At each workstation (Client) from which the *APIS IQ-RM Tools* are to be used, a second installation step must be completed. Here the file `SETUP.EXE`, which is in the program directory of the *APIS IQ-RM Tools* on the Server, must be started. For this second step of the installation procedure, the directory for user specific settings (“Environment directory”) is created and an entry is added in the Windows

Start Menu. Within the local Windows directory the file `APIS-IQ.INI` is created and/or extended, in which the directory information of the installed version is stored.

The reason for the necessity of the second step is as follows: The ***APIS IQ-RM Tools*** has a great number of options and settings (size and position of windows, fonts and colours, etc.). Additionally, the program remembers the documents and structures that you worked with last, the status of the structures (levels folded/unfolded) and so on. This information is stored within the configuration file.

This configuration file, with the standard file name `APIS-IQ.CFG`, is stored in the environment directory. The name of the environment directory is stored in the file `APIS-IQ.INI` in order to find the configuration file when the program starts.

If several users share the same PC, they can still work with different configuration files. The ***APIS IQ-RM Tools*** contain a command that users can employ to change the configuration file to suit their preference.

Network Support

The ***APIS IQ-RM Tools*** are *network enabled*. A program is called network enabled, if several users can use the program at the same time. Without this a copy of the program must be made for each user.

What is on your computer after the installation?

Within the program directory (Server or Client) are the files that make up the ***APIS IQ-RM Tools***. There are two subdirectories with the name `DATA` and `WORKGROUP`. Within the directory `DATA` is an IQ-Document with example data (`EXAMPLE.FME`) and the standard configuration file (`APIS-IQ.CFG`). With a workstation installation (client installation) the files existing in the `DATA` directory are copied in the local management directory, which is chosen during the installation by the User.

In the WORKGROUP Directory are the following files:

File	Purpose
EXAMPLE . FME	IQ-Document with example data
APIS-IQ . CFG	Configuration file; individual (user related) workstation settings
APIS-IQ . INI	INI file; company-specific workstation settings
NORMAL . FMT	Template file; company-specific document settings
SHAPES . ICE	File with graphic symbols, which can be used for Symbol palettes ('C'-Column, Symbols for Process Flow)

Converting existing data

Version 5 of the **APIS IQ-RM Tools** exhibits numerous improvements in comparison to previous versions. Therefore, older IQ-Documents must be converted before they can be edited with the new version. The **APIS IQ-RM Tools** achieves this step automatically. When opening an IQ-Document for editing, the software examines which version the IQ Document was created in and if necessary it is automatically converted. In addition, all IQ-Documents within a directory can be automatically converted via one pull-down menu command.

Previous versions of **APIS IQ-RM Tools** can no longer work with documents that were converted into the most recent format (Note: the **APIS IQ-RM Tools** are not “downward compatible”, therefore, old versions do not know anything about improvements made).

If it is necessary to make the IQ-Documents available to other users, who do not yet have the current program version, then we recommend abandoning the old version before creating new IQ-Documents. To safeguard existing IQ-Documents generated by a previous version of the **APIS IQ-RM Tools**, it is advisable to establish a new directory for these files so that in the future one can work with them again in the old version i.e. make a copy of the old files and place them into a new directory before conversion.

Within the On-line Help of the *APIS IQ-RM Tools* there is a ‘what’s new’ section for version 5, as well as a representation of the changes compared to the previous version.

Importantly: Documents created with the *APIS IQ-RM Tools* may not be edited under any circumstances with another Editor. This leads to the corruption of the data and to program failures.

For the exchange of data with other systems the existing interfaces can be used (chapters: "interfaces to other systems")

What can you do with the APIS IQ-RM Tools?

With the *APIS IQ-RM Tools*, QM Documents can be created. These are known from reference texts, such as the ISO/TS 16949, VDA 6.1 and QS-9000 manuals:

- **FMEA Forms**
- **Process Flow Diagrams**
- **Process Control Plans and/or Control Plans**
- **Plans for Deadlines**
- **Statistical Evaluations**

However, other documents, which are not explicitly mentioned in the above reference texts, can be compiled. These are very useful for providing professional QM Documents, i.e.:

- **Structure Trees**
- **Functions Nets**
- **Failure Nets**
- **Cause and Effect Diagrams**
- **Fault Trees**
- **DRBFM-Support**

Further Tools are available, which can optimise the creation of QM Documents and assist the management of information:

- **Requirement Management (IQ-MORE)**
- **Scorecard Editor and Transfer Function Editor**

- **ORM-Editor (Operational Readiness Management)**
- **Personal Information Manager (PIM)**
- **IQ-Explorer**
- **IQ-Assistant**
- **User-Defined-View**
- **Object Inspector**
- **Editor for Object Comparison**

For the support of timely requirements to the Workflow, version 5.1 offers in certain flavours the following tools for Simultaneous Engineering

- Consolidation Desktop
- Differences overview
- Differences details
- Consolidation selection

First steps

The ***APIS IQ-RM Tools*** utilise the latest style of user interface that can be seen in Windows programs, such as, MS Word or MS Excel. Therefore, users should be able to easily recognise and use the most important concepts of the ***APIS IQ-RM Tools*** (see chapter “The most important concepts of APIS IQ-RM”).

The following items help new users to quickly become acquainted with the ***APIS IQ-RM Tools***:

Computer Based Training (CBT)

With the CBT Tools learning units can be accomplished, which actively arranges the most diverse aspects of working with the APIS IQ-RM Tools for the user. To the delivery includes modules, which introduces the operation of the software and the concepts of System FMEA.

The Assistant

The Assistant supports the user when performing risk analysis, by analysing the current status of the open IQ-Document and thereby offering further advice about how to continue with your work. The Assistant, , is activated via the Help menu. A more detailed description of this Assistant is found in the On-line Help.

Some helpful control references

If a menu command is selected using the mouse, a short description of the respective menu command is indicated within the status bar, seen at the bottom of your window.

The Context Menu, which is opened with one click of the right mouse button, displays the most frequent commands that are likely to be executed for this Object, depending on which Object is selected.

“Special Drag” (dragging with the right mouse button) is a very flexible and powerful possibility of transferring and linking information.

The Properties dialogue box, e.g. found in the Context Menu, displays all properties of the highlighted Object, which can be changed; including the Assistant feature.

What do the Editors of the APIS IQ-RM Tools do?

The following documentation gives an overview of the Tools (Editors) available within the *APIS IQ-RM Tools* and the concepts that can be realized with each. The detailed description of functionality and operation of the Editors are available through the On-line help of the *APIS IQ-RM Tools*; this can be activated via the help menu or by the F1 function key. Additionally, the On-line Help feature has the ability to search for specific topics of interest.

System Structure Representation in the Structure Editor

Within the Structure Editor the user develops a System Structure model; also called the System Structure or just the Structure. The Structure is the basis for further work.

The Structure Editor displays the System Structure as a “tree” which grows on the screen from left to right. This tree shows how the overall system can be divided into Subsystems (also called “System Elements”). This presentation is used both with Product/Systems and with Processes.

For each System Element, the Functions and if necessary, the Failures of this Element can be displayed within the overview.

Function and Failure Analysis

Also, a System Structure can be developed with the Function and Failure Analysis Editor, called the FFA Editor for short.

The FFA Editor represents the elements of a System Structure in a compact form, which is similar to the view style seen in Windows Explorer. It is possible to represent more information on the screen in the FFA Editor than is possible in the graphical representation of the Structure Editor.

Process Flow Diagram (QS-9000)

Within the Process Flow Diagram (PFD), the individual steps of a (manufacturing) Process are placed in succession as a flow chart. Each process step is represented by a Symbol, which can be selected from a symbols palette, which the user can define.

The Symbols used in the PFD can be connected with arrowed lines; line type and line strength can be chosen. Linear successions as well as bypasses and combinations of both can be represented.

The number of parallel steps in a Process and the number of Process Elements that can be contained within a diagram is unrestricted.

Beside the (graphical) flow chart there is a table, where the following additional information can be entered for the individual process steps:

- Name and Number of the Process Element
- Name, Number and Classification of the Process Requirements assigned to the Process Element
- Name, Number and Classification of the Product Requirements assigned to the Process Element

The Classification of the Requirements (Characteristics) is represented by Symbols, which likewise can be chosen from the Symbol palette.

Control Plan (QS-9000)

Within the Control Plan you can find the following information for the individual Process Steps:

- Numbers and Name of the process step
- Required Machine, Tools, etc. for this process step
- Product and Process Requirements relevant for this process step as well as their Number
- Classification of the Characteristics (as Symbols)
- Information for the characteristic tests (kind of action, sample size and frequency, etc.)

- Reaction Plans if the Requirement Specification is not fulfilled

For each Structure there can be more than one Control Plan.

Function Net

The Cause/Effect information for Functions of a Structure and/or a Project is stored in the Function Net. The Function Net shows all Causes and Effects that are possible, for a given Function of the System (called the “Focus Element”) in a graphical representation.

Failure Net

The Cause/Effect information for the Failures of a Structure and/or a Project is stored in the Failure Net. The Failure Net shows all Causes and Effects that are possible, for a given Failure of the System (called the “Focus Element”) in a graphical representation.

Fault Tree Calculation according to DIN

Fault Trees are derived from the Failure Net. Additionally, they contain logical connections (AND, OR, NOT) between the Failures as well as Failure probabilities for elementary Failures. With this information, the Fault Tree computes the Failure Probability for top-level Failures.

Cause and Effect Diagram

The Cause and Effect Diagram combines the Structure representation with the Failure Net information. It shows the position of the individual Failures within the Structure and additionally, for each Failure, its direct Effects and Causes.

FMEA Formsheet (VDA, QS-9000, MIL, etc.)

The FMEA Formsheet contains the following information:

- Failure Modes of the Functions for one or more System Elements
- Potential Effects and Potential Causes of different Failure Modes
- The Severity of the Potential Effects and the Classification information

- The Preventive and Detection Actions listed as Current Controls, which are entered for the Potential Causes or Failure Modes
- The effectiveness of these Actions in the form of Occurrence (O) and/or Detection (D) values
- The RPN (product of S, O and D)
- Planned Preventive and Detection actions
- Responsibility and Deadline for the Preventive and Detection actions
- Status of the planned actions and their expected effectiveness, expressed by new O- and D- values

The information is represented in several different formats (layouts) (VDA 96, VDA 86, QS-9000, MIL among others). The user can easily switch between these different layouts.

Forms offer many editing possibilities, e.g.:

- Any kind of comments (also graphics) can be stored and viewed in the Form
- The translation of the Data into other languages can be made directly in the Form
- The contents of the FMEA Formsheets can be sorted and filtered in various ways

Deadline Editor (Action Tracking)

The Deadline Editor lists the responsible person for each individual Action, the target completion date and any additional information, and therefore is useful for project management. The Actions for a single Formsheet (or all) within the current IQ-Document can be displayed. From the Deadline Editor, responsibilities can be sent out by E-mail. Besides the default layout of *APIS IQ-RM*, a layout can also be used for Action Tracking in accordance with VDA 96.

The contents of the Action Tracking can be sorted and filtered in various ways.

Statistical Evaluations

The Statistics Editor supplies numbers and graphics based on the evaluation of risk within a System. The following analyses are available:

- Pareto Analysis: Representation of the portion of the most severe failures within the total risk (20/80-Rules)
- Difference Analysis: Shows the improvements of the risk valuations through completed actions and/or the more recent state of actions not yet completed
- Frequency Analysis: RPN Frequency distribution within the data
- Actions for Responsible Persons: Overview giving information of actions assigned to the responsible person

All of the evaluations can be adjusted to your needs by changing the parameters. The rankings can be saved and requested later.

Variants Matrix

The Variants Matrix offers the possibility of defining and comparing contents of the different Variants within a Structure. The IQ-Objects of the Structure are contained within the rows of the Variant Matrix and the Variants can be found within the columns. IQ-Objects can be added to and/or removed from the Variants by clicking with the mouse in the cells of the matrix.

IQ-Explorer

With the IQ-Explorer, existing (FMEA) knowledge can be searched and reused. It has a number of powerful search features usable within IQ Documents. The search results can be copied into existing Documents.

The IQ-Explorer works similarly to Windows Explorer, however a large number of additional possibilities are offered since the IQ-Explorer knows and can use the relevant Structure information within its search. In its simplest form the IQ-Explorer is used to look for QM Documents, in which certain text is contained.

This Search can also consider dates. Besides that, there are further complex search criteria in the IQ-Explorer, e.g.:

- Which kinds of IQ-Objects shall be included in the Search? (System Elements, Functions, Failures etc.)
- Which additional conditions these IQ-Objects are to meet (e.g. whether Failures are only to be found if they are Causes of other Failures and have Actions assigned to them)
- Whether the Search is to take place within the current document only or in all documents albeit in one or several directories
- Which directories of the file system are to be searched
- Whether backup copies of the documents are to also be included in the Search
- A similarity search will have positive results even if there is a difference in spelling (e.g. if you are searching for the word 'dialogue box', but in the document it is 'dialog').

The results of complex search queries can be saved and reused later on.

Multi-language support (contents)

With multi-language support, contents of the IQ Documents can be managed in several languages. It is possible to translate contents directly in the FMEA Form, in the Control Plan or in the Process Flow Diagram. In addition, the multi-language support offers tools for the administration of multilingual contents. With these tools, untranslated IQ-Objects and also IQ-Objects whose translation is not up to date can be identified

Team-Communication (E-mail, Internet)

This module offers the following possibilities:

- Automatic sending of E-mails to responsible people regarding the Status and feedback
- Sending Forms by E-mail

- Publishing the FMEA information for the Internet or Intranet using the Web Publisher

IQ-Assistant

The IQ-Assistant supports the user both with operating the program and with constructing the FMEA. It leads the user step by step through the process of FMEA creation even if the user does not know all details necessary for the operation of the program. Instead the user can choose from a proposed list of tasks, which can be accomplished and then the Assistant performs the necessary steps to complete them.

But the support of the Assistant goes further: it also gives methodical help, i.e. it supports the user when creating the FMEA in accordance with rules described in the literature. Also in order to support company or user defined operational standards, the Assistant can be adapted to fulfil these needs.

PIM (Personal Information Manager)

The PIM helps to organise your FMEA work. It can, by means of Bookmark technology ("Bookmarks"), which has been popularised by the Internet, clearly organise the work. Within the PIM the user has the following possibilities:

- Manage bookmarks for IQ-Objects
- Attach arbitrary comments to the Bookmarks (including graphics and links)
- Arbitrary structuring of the Bookmarks
- Manage several Bookmark lists per document
- Manage private and public entries– the private entry is assigned to the current user
- Records automatically generated IQ-Objects

Parts Functions Matrix

The Parts Functions Matrix offers an alternative possibility for anchoring Functions and/or Characteristics at System or Process Elements. Within this matrix the System / Process Elements from the specific Structure are located within the rows and the Functions / Characteristics are found within the columns. By a

mouse-click within a cell of the matrix, a Function can be anchored to a System Element, for example.

Customer Requirements Editor

The Customer Requests Editor displays requests, e.g. from customers, suppliers, or from standard documents such as ISO/TS 16949, in a net similar to that used by the Function and Failure Net Editors.

Customer Requirements Management

The Customer Requirement Management Editor lists the requests in a table, similar to the Deadline Editor for actions.

The Scorecard Editor

Within the Scorecard Editor, the framework of a Scorecard used by SixSigma can be defined. Within the Scorecard, quantifiable Characteristics of one or several System Elements are summarised and for each Characteristic certain numeric parameters can be obtained or computed. Functions defined by the user (Transfer Functions) are used for calculation.

The Transfer Function Editor

Within the Transfer Function Editor the Functions, which are needed for the Scorecard calculation, are defined with the help of a graphical user interface.

The ORM-Editor

Within the ORM-Editor, the behaviour of Systems used for on-board diagnosis and failure handling capabilities can be represented and examined.

User-Defined Views

Thus the user can sketch own forms, with which parts of data contents can be presented, printed, filtered and worked on. Starting from the stages of development IQ-FMEA PRO and IQ-RM PRO there is the possibility not only to name, but also to save different views.

Object Inspector

The object supervisor shows all characteristics and structural relations of an object in tabular form. The characteristics can be also worked on in this editor. The Object Inspector (Editors|Objectinspector) offers a clear presentation of the values/attributes and linkages of the respective object in tabular form. The Object Inspector is the suitable tool for working on the values/attributes of an object. Seizing and working on variant-specific values is supported as well as the administration of multilingual data contents of an object. With the command inspect object in the context menu of the Object Inspector the marked object becomes the new content of this editor.

Editor for Object Comparison

The Object Comparer Editor enables two different objects to be placed next to each other and compared directly. For this, it is advisable to split the Personal Desktop into two work areas. In one, the Object Comparer Editor is opened, while the other shows another view of your FMEA. In order to perform an Object Comparison, mark the desired object and drag and drop it into the Object Comparer Editor. You can use same procedure for the second object; drag it next to the object selected first. Alternatively, you can select the objects to be compared via the menu

File|Administration...

Once you have dragged the two objects to be compared into the Editor, all relevant information on both objects are contrasted. The object comparison enables you to act in a multi-structure manner as well as to also include the variants.

Concepts of the User Interface

The following Windows can be opened simultaneously:

- Personal Desktop
- Data Manager
- Forms/Reports
- Formsheets-Analysis
- CARM-Server Administration (Services Manager)

Personal Desktop (PD)

Within the Personal Desktop, two views (Editors) of the IQ-Data can be combined and synchronised, e.g. the Structure view and FMEA Formsheets. The Editors can work with the same IQ-Document or with different IQ-Documents (allowing for simple information exchange between documents).

A combination of two Editors is called “work space”. Some work spaces are predefined; e.g. the combination Failure Net and Structure Editor. This combination replaces the work area of the old Failure Net Editor. Further combinations can be defined and assigned to a function key.

The Personal Desktop notes all edited items that were developed in the course of a meeting, i.e. which Data was edited and in which Editor. It is possible to navigate by this list of edited items, similarly as with an Internet browser that tracks visited addresses.

The Personal Desktop supports Drag & Drop (dragging and dropping) including “Special Drag” (pull with the right mouse button) for transferring attributes of an Object.

When running ***APIS IQ-RM Tools***, the last workspace used will open each time; for first use this is the Structure Editor by default.

Data Manager

The Data Manager is the standard interface for “Administration Units”. It is activated from the Personal Desktop via the Administration Menu. There are the following Administration Units:

- Persons and Teams (in order to specify responsibilities for actions)
- Requestors (are assigned to customer requests)
- Valuation Catalogues (for standardising the risk valuation)
- Terminology and translation (for standardising the terms used as well as for translating)
- Notes List (for the administration of Notes Categories, translations and HTML links within the Notes)
- Palettes (for the administration of the Symbols, which are used in PFD for indicating the kind of the process step and for classification)

- Symbolic Responsibilities and Deadlines (to be used for the Actions and customer requests)
- Catalogues (for the administration of the vocabulary used with Functions, Characteristics, Failures, Actions and Requests)
- Machines (needed in the Control Plan)
- Inspection Equipments (needed in the Control Plan)
- Assistant Rules (determine the strategy of the Assistant)

The most important concepts of APIS IQ-RM

QM Documents

What is a QM Document?

QM Documents are documents, with which Quality Management activities are recorded concerning a Product or a Process. Many QM Documents are specified in standards and publications, e.g. in VDA 6,1, QS-9000 or ISO/TS 16949. One purpose of *APIS IQ-RM* is to comfortably provide consistent QM Documents. The concepts and procedures described in this chapter support this.

Which QM Documents can be created with APIS IQ-RM?

The following table gives an overview of the most important QM Documents that can be created with *APIS IQ-RM* and points out with which Tools (Editors) these QM Documents can be created / edited.

<i>QM Document</i>	<i>Created with</i>
FMEA Formsheets according to QS-9000 (2nd edition / 3rd Edition)	Forms Editor
FMEA Formsheets according to VDA 96	Forms Editor
FMEA Formsheets according to VDA 86	Forms Editor
FMEA Formsheets according to MIL task 101	Forms Editor

FMEA Formsheets according to MIL task 102	Forms Editor
DRBFM Formsheets	Forms Editor
Process Flow Diagram according to Ford/Daimler Chrysler/General Motors	PFD Editor
Control Plan according to QS-9000	Control Plan Editor
Plan for Deadlines according to VDA 96	Deadline Editor
Graphic Structure Tree	Structure Editor
Structure Tree in List view	FFA Editor, Structure Editor
Function Net	Function Net Editor
Parts Functions Matrix	Editor for Parts Functions Matrix
Failure Net	Failure Net Editor
Fault Tree according to DIN 25 424	Failure Tree Editor
Variants Matrix	Variants Matrix Editor
Deadlines Overview Editor	Deadline Editor
Statistic Evaluations	Statistics Editor
Request Structure	Editor for Customer Requests
Request check list	Editor for Customer Requirement Management
Scorecard	Scorecard Editor
ORM Diagram	ORM-Editor

IQ Documents

What is an IQ Document?

An IQ-Document is a file with the extension FME . Multiple projects can be saved within this file.

If the **APIS IQ-RM** software was installed correctly, the IQ-Documents are registered in the operating system, i.e. an IQ-Document is displayed within the

Windows Explorer with its own icon and in the Column “Type”, the description “APIS IQ-Document” is given.

This means that an IQ-Document can be opened by one double click, e.g. from the Windows Explorer or as an attachment from an E-mail.

Note: An IQ-Document should *never* be opened with a text editor or another program. This leads to program errors and to data loss.

What are the contents of an IQ-Document?

Within an IQ-Document several Projects / Structures can be saved, along with all associated QM Documents. Because of the redundancy-free, object-oriented approach of *APIS IQ-RM*, a QM Document is not different from one view to another view because it contains the same data, i.e. the IQ-Document with all its IQ-Objects and relationships. Views like the FMEA Formsheets, Process Flow Diagram, Control Plan, the graphical Structure Tree, Function and Failure Nets, Plans for Deadlines etc. are always completely integrated and thus contain the same information. Changes made to IQ-Objects in one view automatically have effects on all other forms that contain the same information.

The information in an IQ-Document is controlled by a general Terminology Control and makes the intelligent re-use of information possible.

Certain information is global for an IQ-Document (the FME file), i.e. it affects all IQ-Objects and views in this Document. Particularly these are:

- Valuation Catalogues: the Valuation Catalogue set up within the IQ-Document is used by default everywhere where risk valuations are to be assigned, e.g. in the FMEA Formsheets
- Symbol Palettes: the Symbol Palettes set up within the IQ-Document by Default are used by all views that use Symbols, e.g. in the Process Flow Diagram
- Core Teams and Persons: the Selection List for Responsible People for actions is always the same in all Structures of the IQ-Document

Can several users work on the same IQ-Document at the same time?

If your flavour includes the Tools for Simultaneous engineering, then several users can work at the same time on the same document. For this the document is copied

in special kind (a "clone" is provided). These clones can be worked on independently in the usual way and they can become united again in the at given time in the consolidation Desktop (consolidated).

If you don't work with a clone, the first user who opens an IQ-Document can change its contents without restrictions, depending on their access rights. During this time, other users of the document will have read only access.

Projects

Projects are organisational units within an IQ-Document. They bring together one or more Structures that are related, e.g. the System, Design and Process Structure for a Product. The number of Structures contained in a project is not limited.

For each project a network of Requests can be developed.

Structures

What is a Structure?

APIS IQ-RM uses the Structure as a data model which encompasses/contains all information that is relevant for the creation of QM Documents. The Structure consists of IQ-Objects from the data model of **APIS IQ-RM** and their relations to each other. The Structure is absolutely redundancy-free and thus guarantees the consistency of all QM Document contents.

The QM Documents that are created with **APIS IQ-RM** are only different views of this Structure and its data.

A Structure has the following attributes: Name, Owner, Type (System, Design, Process), Root Element and number (optional).

The *Name* of the Structure can be viewed in various selection lists and in the title bar of the Structure Editor and the FFA Editor. It should be detailed and recognisable.

The *Owner* of the Structure can assign other users' access levels on "their" Structure.











The *Number* of the Structure is used in order to produce clear Numbering for all IQ-Objects within the Structure.















The *Root Element* is the "starting element" of the graphical tree. We recommend choosing a shorter name for the root because of the limited space on the screen a

long name will restrict the space to view the structure. However, *APIS IQ-RM* does not have any restrictions on the length of the Structure Name or the Root.

Which IQ-Objects and relations are there within the Structure?

Within the Structure the following IQ-Objects can be contained; for most of them a special Symbol is used in *APIS IQ-RM* and is used in different places within the graphical user interface:

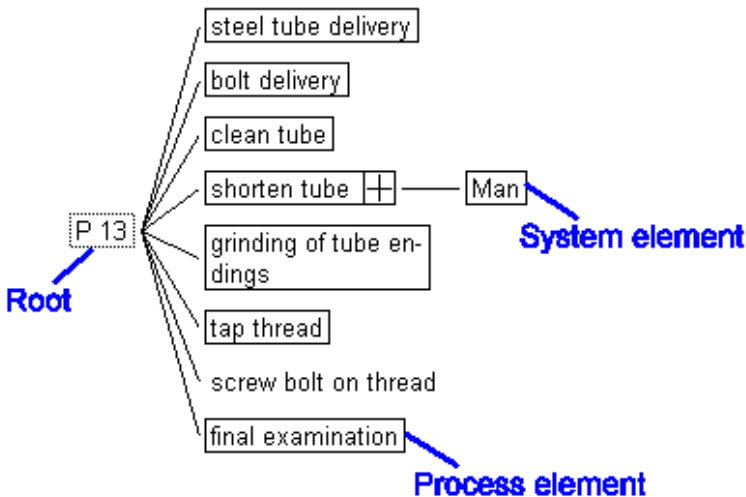
<i>Object</i>	<i>Comments</i>	<i>Symbol</i>
Variants	Are used in order to store several Structures compactly, which differ only slightly from each other and these are redundancy free	-
System Element	The elements of the system at hand i.e. the components within the system or sub-components	
Process Element	The elements of the system at hand i.e. the process steps within the system or features of the process step (e.g. Man, Machine, Method, Environment and Materials)	
Graphical Structure Tree	Visual representation of System Elements in relation to each other (relation: “consists of” resp. “is part of”)	  
Process Flow Diagram	Visual representation of Process Elements in relation to each other (relation: “follows” resp. “is followed by”)	
Function	Qualitative requirements of the System and Process Elements	
Requirement	Quantitative requirements of the System and Process Elements; differentiated according to Product and Process Characteristics	 
Function Net	A visual representation of Functions and Requirements in relation to each other (relation “contributes to” resp. “depends on”)	

Failure	Failure of the Function or Requirement (Malfunction)	
Failure Net	Visual representation of Failures in relation to each other (Relation: “Causes” and “Effects”)	
Preventive Action	Indicates how Failures are avoided; their effectiveness is represented by the ‘O’ value	
Detection Action	Indicates how Failure Causes are discovered, their effectiveness is represented by the ‘D’ value	
Revision State	Represents a stage of the continuous improvement process by indicating what Actions for Failure Causes, over time, were implemented	
Action Group	Documentation of the risk by evaluation of one or more Preventive / Detection Actions, which produces an RPN.	
Responsibility (Person)	Team member who is held responsible for the implementation of a Detection or Preventive Action.	
Deadline	Time allotted for the completion of Actions.	
FMEA Formsheet	Summary of the information contained within the Failure Net, Failure risk, current and/or planned Actions as well as their effectiveness, in a tabular style.	
Control Plan	Describes the characteristics of individual process steps that have specifications as well as tests, controls and reactions to a non-conformance	
Operating Condition	Describes the different states of a system for the ORM-Analysis	
Backup Mode	A subset of all possible operating conditions used in the ORM-Analysis	
Failure Effect	Used for the ORM-Analysis	
Internal Detection	Representation of the On-Board-Detection within the ORM-Analysis	

The Graphical Structure Tree

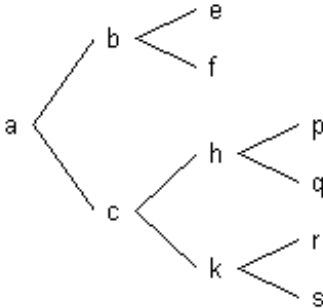
Components of the Graphical Structure Tree

Within the graphics pane of the Structure Editor, the Structure is represented as a tree that grows from left to the right. We call this tree the **Graphical Structure Tree**. It consists of System or Process Elements. The element standing furthest to the left of the graphic Structure Tree is called the **root**.

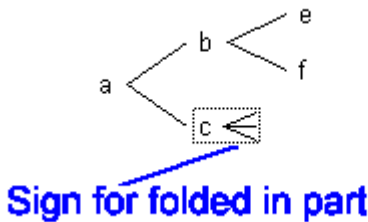


Folding Operations in the graphical Structure Tree

In order to get a better overview of the Structure Tree, parts can be folded and hidden from view. The effect of the different instructions for folding is demonstrated in the following abstract example:



A folded Part of a tree is marked as follows:



The following commands described are found in the View menu.

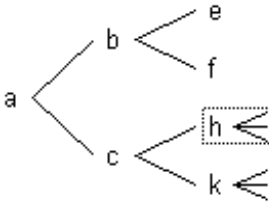
Show All

The entire graphic Structure Tree is unfolded.

Fold and Unfold Level

All elements that are in the same level of the tree as the marked element are folded.

In the following example the element *h* was marked, before the instruction was given.



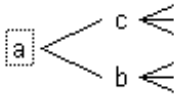
If the command is again used, then it unfolds all elements that are in the same level as the marked element.

Show Branch

A folded Part of a tree is completely unfolded.

Show Next Level

The elements of the next level are shown; for the selected branch and one level only. In the following example the root was marked when the instruction was given.



Hide Branch

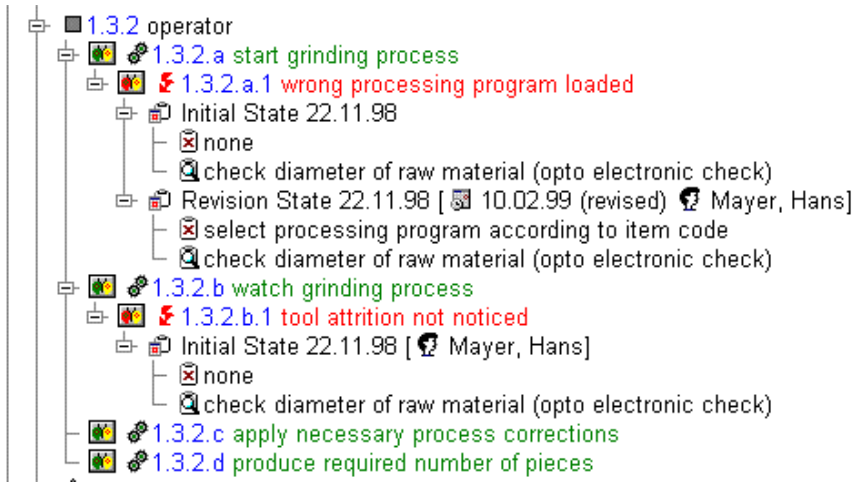
The entire branch starting from the selected IQ-Object is folded.

Anchoring

In *APIS IQ-RM* objects possess relationships with other objects. Using *APIS IQ-RM* terminology, we say that (dependent) IQ-Objects are anchored to other (independent) IQ-Objects, thus:

- Functions and Characteristics are anchored to System and Process Elements
- Failures are anchored to Functions
- Actions are anchored to Failures

The following illustration shows a System element “Operator” of a Process, to which two Functions and a Process Requirement are anchored. A Failure is anchored to the Requirement and/or Functions, and with these Failures there are Revision States (the example shows Initial States) with different Actions anchored respectively.



It is important that in *APIS IQ-RM* a dependent IQ-Object (subordinated) can never exist without its associated anchor. If necessary, *APIS IQ-RM* will automatically generate missing anchors.

If, for example, an action is created in a completely empty FMEA Form, then *APIS IQ-RM* produces for this the three IQ-Objects, on which the action depends, i.e. for Failure, Function and a System Element. We refer to this type of connection as “automatic anchoring”.

Re-use of IQ-Objects

What does re-use mean?

In its simplest form, reusing means copying from already existing information. We are already familiar with this due to modern word processing programs: you copy text from an existing document and add it into the same or a new document.

This kind of copying Text is offered to you by *APIS IQ-RM*.

However, after copying a passage of text you often realize that it contains a spelling mistake. When working with a text system you then have to correct the spelling mistake twice, i.e. within the original text passage and the copied version.

In *APIS IQ-RM* there is a far more useful concept i.e. the *re-use* of data. For example, if an IQ-Object is reused instead of only just copying the text, then a

spelling mistake need only be corrected once (no matter where this is performed) and all other occurrences will be corrected automatically, no matter where they are.

The concept for reusing in **APIS IQ-RM** offers many other advantages:

- IQ-Objects can be chosen from Catalogues
- IQ-Objects are subject the Terminology Control
- IQ-Objects take part in inheritance
- IQ-Objects bring along all dependent IQ-Objects anchored to them
- IQ-Objects must be translated only once

Which IQ-Objects can be reused?

The following IQ-Objects of the data model can be reused in the method described above

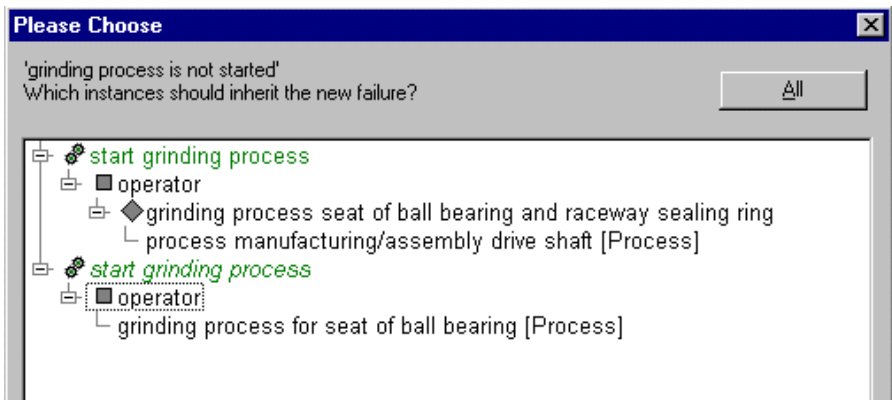
- Functions
- Requirements
- Failures
- Preventive Actions
- Detection Actions
- ORM Operating Conditions
- ORM Backup Modes
- ORM Failure Effects
- ORM Recognitions
- ORM Actions

In connection with reusing in **APIS IQ-RM**, certain terminology is used. If an IQ-Object is reused, you say it has “several occurrences”. If within an IQ-Document, the same Function is reused twice, it then has three occurrences (in the IQ-Document).

Inheritance of Failures

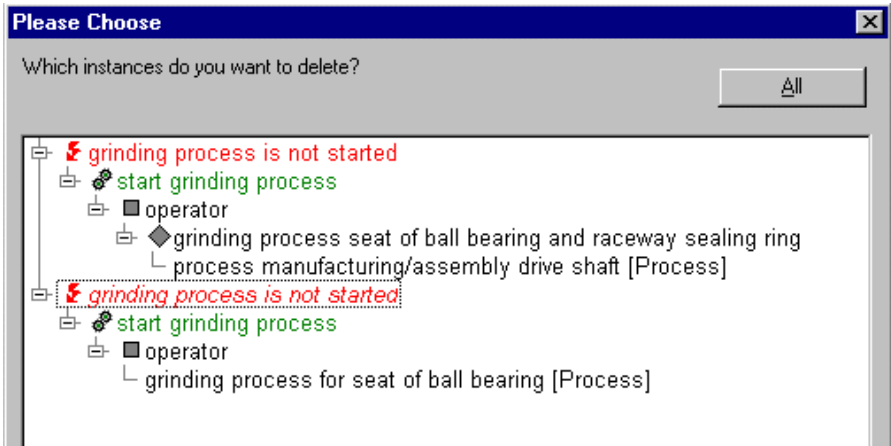
APIS IQ-RM provides inheritance of Failures for reused Functions. Existing Failures are carried forward and likewise reused. Furthermore, if Failures are introduced within a Function with several occurrences, then these Failures can be distributed to all other occurrences, i.e. more occurrences of the new Failures are produced and anchored at the other occurrences of the function.

The following illustration shows the dialogue box displayed by **APIS IQ-RM Tools** for the following case: a new Failure (“grinding process is not started”) is anchored with a Function (“start grinding process”), whereby that Function has more than one occurrence (in the Structures “process manufacturing/assembly drive shaft” and “grinding process for seat of ball bearing”):



If a Failure is deleted that is anchored to several occurrences of the same Function, then you will be asked to decide from which occurrences of the Function the Failure is to be removed.

The following illustration displayed the dialogue box in the case where a Failure is to be deleted:



In both cases the user can decide whether to complete the task with all IQ-Objects concerned or only with the selected.

The user has the opportunity to make *no* decision about which IQ-Objects are to be changed, or, can confirm within the dialogue box the IQ-Objects that the changes are to be applied to i.e. just one instance or every instance. This behaviour corresponds to a “Fail Safe strategy”, the user can conveniently change a desired IQ-Object and this only. The user controls the changes made in other places via this dialogue box.

Reusing or copying?

In order to reuse IQ-Objects, there are two possibilities in *APIS IQ-RM*:

- The Input Collector
- Direct dragging of re-usable IQ-Objects with the mouse (Drag & Drop)

It is possible, however, to copy only the Text of an Object without reusing the Object. For this, Special Drag can be used (Special Drag = Drag & Drop with the right mouse button in place of the left mouse button as with normal Drag & Drop).

IQ-Objects and Object Attributes

The chapter “What are the contents of an IQ-Document?” describes the IQ-Objects that *APIS IQ-RM* knows. An IQ-Object is loosely referred to as something that one can click on from within the user interface. IQ-Objects now have different attributes, e.g. Failure can exhibit severity. The severity is one of the attributes of the Object’s Failure. In principle, the attributes of an IQ-Object can be seen and edited via the Properties dialogue box. The Properties dialogue box can be opened with the Windows Default key combination **Alt+Enter**.

Document Template

With the Template concept, *APIS IQ-RM* offers a simple means to set and distribute, throughout the company, default settings established for company use (company specific standards). In a simple manner, the Workstation Settings of a user of *APIS IQ-RM* can be put back to a company-specific default.

This is administered in a Workgroup Directory in a file, called `NORMAL.FMT` (FMT = FME Template), in which the Document-referred Settings are contained. If a new IQ Document is created, the contents of this Template are transferred into the new IQ-Document. Thus all Default Settings etc. are contained in the Document and “also move with it”, e.g. if that IQ-Document copy is sent by E-mail. If there have been changes within the settings of a document, then the Template contents can be reloaded at any time from the `NORMAL.FMT` file.

It is also possible to transfer settings from any IQ-Document into the `NORMAL.FMT` at any time. If, for example, a company requires a previously defined Valuation Catalogue is to be used, it is possible to transfer this Valuation Catalogue into `NORMAL.FMT` in order to make it available for others. The commands needed for this are found in the pull-down menu “Tools”.

Input Collector versus Direct Input

For the collection of information *APIS IQ-RM* offers two different possibilities:

- **Direct input**
- **Work with the Input Collector**

Direct input can best be explained using the FMEA Formsheets as a basis: If a user works in the FMEA Form with Direct Add active, data will be entered directly into

empty fields (“cells”) of the formsheet. This functionality is similar to that found with MS Excel.

APIS IQ-RM supports the direct input not only in the various Formsheets Editors (for FMEA, Control Plan, Process Flow Diagram), but also in all other Editors.

If however, a user works with the input collector, then they have access to libraries? of the re-usable IQ-Objects of **APIS IQ-RM**. In addition, the input collector is often more efficient, if several items of information of the same kind are to be entered in one step.

APIS IQ-RM offers different possibilities, in order to work alternatively with or without the Input Collector. The simplest way is by using the following keyboard short-cut commands: **Insert** will always result in a direct entry of data, **Shift+Insert** will always open the Input Collector.

Terminology Control

In order to make reusing the knowledge contained in APIS IQ Documents possible, uniform terminology is recommended. The names for re-usable IQ-Objects (Functions, Characteristics, Failures and Actions) should be uniformly assigned and used within the IQ Documents. **APIS IQ-RM** partially guarantees this if the user enters data through the input collector with catalogue. But, if different people work on the data within a system, it is possible to enter, for example, different names for the same Function/Failure or the same term could be entered several times.

The following cases could happen:

1. User A entered a Function with the name “check quality of pressure” within a System Element, whereas User B then enters a Function with the name “test pressure quality” for another System Element. Obviously these Functions have the same meaning. With the Terminology Control, the two different Functions can be merged so that **APIS IQ-RM** regards them as reused and they are subject to inheritance.
2. User A entered a Function with the name “compatibility to other materials” within a System element, and User B enters a Function *with the same name* for another System element (e.g. because they did not notice the existing Function in the Selection List). The Terminology Control can merge these terms as well.

User Management and Access Rights

User administration is integrated into **APIS IQ-RM**. The System saves different information about a specific user (name, department, telephone numbers and E-mail addresses). You can decide on the specific Fields that will appear in QM Documents and on their order.

For ease of organisation, users can be grouped into teams. Teams and team members can be saved within the IQ-Documents, they can also be transferred into the Template and then re-used at a later date. In each IQ-Document at least one special user exists by default, this is known as the **Supervisor**.

Passwords can be assigned to the Users by the supervisor. Likewise, a password can be assigned to the supervisor itself (“supervisor password”). In this case, the supervisor password is then required in order to change the passwords of other users. As long as no passwords are assigned for users, **APIS IQ-RM** is a completely open System: each user can – according to their access rights within the network – open and change an IQ Document. This changes as soon as passwords are used within the IQ Document. When working with an IQ Document, a user is always logged in. The supervisor is the default user, however different users may also login themselves. Furthermore, **APIS IQ-RM** remembers for each IQ-Object, within the data model, which user has created and modified it.

As soon as a password is assigned for any user, they then must enter it to be able to work with the IQ Document. The Teams and Persons Administration can also be used to specify Access Rights for particular Structures within a given IQ-Document. In the Teams and Persons Administration, people are saved who are to be listed as Responsible for Actions in QM Documents.

Please Note: **APIS IQ-RM** has a very effective method for access control, which is based on passwords assigned to its users. If these are forgotten, then there is no possibility of opening a password secured IQ-Document. This IQ-Document must then be sent to the APIS Support before it can be unlocked. **You will have to pay for this assistance.** We recommend, for this reason and also for ease of management (“single point of administration” for passwords), to primarily use the access mechanisms of your operating system.

Multilingual Documents

APIS IQ-RM supports the possibility of storing the contents of an IQ Document in several languages. This is particularly of interest for such users who are globally active. A typical scenario for the employment of multilingual documents follows:

- In France an FMEA is created for a System, the reference language is French. TIP: For each IQ-Document, a reference language must be given. This is normally the language in which the document was created; in it, there must be a name for each translatable object.
- This Document will be worked with in Brazil. For this, Portuguese is assigned as the target language for the IQ-Document. All IQ-Objects of this FMEA (System Element, Functions, Failures, action etc...) are now translated into the target language. This can take place either by means of direct input, in the translation mode of the Forms Editor, or by using the translation dialogue box, “Terminology and Translation”, within the Data Manager.
- From now on IQ contents can be viewed in French or in Portuguese. In many views, it is also possible to see both languages simultaneously.
- In Brazil work can continue on the Structure. Since work does not happen in the Reference Language, each new *IQ-Object* receives its Portuguese name *added* into the Reference language. Therefore, when working in the Reference Language French, the changes made in Brazil can be quickly recognised.
- **APIS IQ-RM** supports synchronisation of different language versions in comparison to the reference language. If a French term changes, a change must also be made to the corresponding Portuguese term. Such changes can be recognised automatically by the program with the tool for the administration of terminology and translation.

The following steps are important when working with multilingual documents.

When you create a new IQ-Document the **reference language** for the document is specified.

Through the Menu command **Tools | Create a New Document Language** other languages can be added to the reference language. **APIS IQ-RM** now knows that for each IQ-Object in addition to the reference language term, there can also be another term entered within the desired translation language.

APIS IQ-RM recognizes:

- Whether there is already a term for the object in the translation language
- Whether the term is current in the translation language
- or, whether the reference language term is current

If you choose to display a language other than the Reference Language, **APIS IQ-RM** shows the term in the translation language for each object, *if there is a translation*. If no translation is found, the term existing in the reference language is used. The current language is shown within the Status Bar of each editor. The reference language of the document is characterised by a “>” placed in front, for example “> German”.

To translate an IQ-Object, there are several possibilities:

- Change the desired translation language and rename the object in any editor
- Use the Administration Tool for terminology and translations. For this it is not required to change into the Translation language.

If a user works in a translation language, new IQ-Objects can also be produced. Pay attention that in this situation **APIS IQ-RM** cannot know the reference language term of these new IQ-Objects; this, however, must exist. Within the reference language, the new IQ-Objects will get the same term they were given in the translation language.

Versioning of Data

“Versioning” means to take a snapshot in time of a defined processing state of the data. The conditions within the IQ-Document are frozen as they were at that time, and can be viewed and printed, but not modified in any circumstances. Of course, you can continue to work on your original data. Versioning can take place at any time. In this way a user can document the complete development course of the versioned object over its entire life span.

Creating Versions is possible in IQ-RM for the following IQ-Objects and/or views:

- **Structures**
- **FMEA Forms**

If a Structure is versioned, then that means that all contained IQ-Objects and their possible views (see above) are frozen. It is also possible to version, within a Structure, individual or all FMEA Forms. In extreme cases, several versions of FMEA Formsheets can be contained within a Version Structure.

Along with the FMEA Formsheet, a Cover Sheet is saved when creating a Version. Formsheets Versions can only be viewed and printed. Contents of the Form cannot be modified any longer. However, it is still possible to:

- Change the Form layout
- Change the language of contents (if contents are translated into other languages)
- Change the Display Options for the Version
- Change the Column Widths
- Create the Form-referred Evaluations for the Version
- Filter and sort the Form

Function Nets

Functions Nets describe how subordinate Functions cooperate in a System in order to ensure main functions. They bring Functions into a cause-effect relationship. Within the Functions Nets of ***APIS IQ-RM***, Functions can have an unlimited number of Causes and Effects (sometimes referred to as “consequences”). The Functions that only have Causes in a system are called Top-Level-Functions or main functions. The Functions that only have Effects in a System are called Bottom-Level-Functions or basic functions. In other words, the Function Nets of ***APIS IQ-RM*** describe how the main functions are derived from the basic functions through the intermediate Functions. The number of steps between a basic function and a Top-Level-Function is unlimited in ***APIS IQ-RM***.

Failure Nets

Failure Nets describe the failure linkages in a System. They bring Failures into a cause-effect relationship. Within the Failure Nets of ***APIS IQ-RM***, Failures can have an unlimited number of causes and effects and/or consequences. We call Failures that only have Causes in a System Top-Level Failures. We call Failures that have only consequences, Bottom-Level Failures or elementary Failures. The Failure Nets of ***APIS IQ-RM*** describes how Top-Level Failures develop in steps

from elementary failures (Fault Tree View) or which effects are caused by an elementary failure in a System (Event Tree View). The number of the steps between an elementary failure and a Top-Level failure is unlimited in *APIS IQ-RM*.

Revision States

The “E” in FMEA stands for “Failure Effects”. In the valuation and optimisation phase, the FMEA can be described as how to evaluate critical Failure Causes and/or Actions. Usually a Current-State analysis is performed (What Actions currently exist? = risk assessment/evaluation) and a Target-State is added to oppose it (What new Actions shall be introduced? = risk reduction/optimisation). This Target-State is planned for a certain Deadline and can be introduced, when needed, at any time. Thus the former Target-State becomes the new Current-State. The “classical” FMEA, as it is in the FMEA Forms in accordance with QS-9000 and VDA 86, ends here. However *APIS IQ-RM* also supports the newer system analysis according to VDA 96, whose form makes the documentation of a continuous improvement process possible. Therefore *APIS IQ-RM* does not insist on the terms of the Current-State and the Target-State. In *APIS IQ-RM*, it is possible to attach as many Revision States as desired to a Failure and/or Failure Cause, for which one is always the current state; the others are just an historical record of completed or planned Actions. Within a Revision State there can be several Actions Groups, whilst under normal conditions only one Actions Group would be necessary.

In a case where you would like to document that no planned Actions are to be implemented, one can activate the appropriate option from within the Properties dialogue box of the specified Revision State. This ensures that the column for planned Actions within the FMEA Formsheets is filled out automatically, in accordance with QS-9000.

Actions Groups

Actions Groups contains one or more Preventive and Detection Actions and rate them with a common RPN. All Preventive Actions in an Action Group are evaluated together regarding their effectiveness and receive the same Occurrence. The same procedure is taken with the Detection Actions concerning the Detection.

In **APIS IQ-RM** a Revision State can contain several Actions Groups. This possibility can be used to document alternatives considered by the FMEA Team. If there are several Actions Groups in a Revision State, all of them except one are to be marked as “abandoned” (discarded) for the RPN calculation.

Actions Groups are only visible within a Revision State if there is more than one. Under normal circumstances, a Revision State contains only one Actions Group that is not seen.

Interfaces to other systems

For the transmission of data into other systems different export formats are available. You will find the appropriate options under `file export`:

- **XML file (* xml)** - Exports the current structure into a XML file. The exported XML file is based on the MSR FMEA DTD, version 2.1.2. This Document Type Description (DTD) is included in the delivery and is stored in a sublist of the data catalog. With the installation the DTD file is selectable for the software.
Note: Files in the XML format can be imported in IQ-RM again
- **ODBC** - Exports the current structure into a format, which operates as interface to relational data bases (e.g. to MS Access). A specification of the tables is stored in the sublist ODBC of the data catalog as well as an example of an inquiry.
- **HTML document** - Exports the current structure and/or contents of the current editor into a HTML file.
- **Windows Metafile (* wmf)** - Exports the form and/or contents of the current editor into a WMF file.
- **Several Windows Metafiles (* wmf)** - Exports the form into several WMF files (one file per form side).