ARIS RISK & COMPLIANCE MANAGER
SEMANTICS VERIFICATION FOR EXPORTING DATA

VERSION 10.0 - SERVICE RELEASE 9

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Contents

1 Text conventions

Menu items, file names, etc. are indicated in texts as follows:

- Menu items, keyboard shortcuts, dialogs, file names, entries, etc. are shown in **bold**.
- Content input that you specify is shown in **<bold and within angle brackets>**.
- Single-line example texts are separated at the end of a line by the character ↵, e.g., a long directory path that comprises multiple lines.
- File extracts are shown in the following font:

  `This paragraph contains a file extract.`

- Warnings have a colored background:

Warning

This paragraph contains a warning.

2　　　Introduction

When modeling in ARIS, certain conventions must be adhered to. If these conventions have not been observed, the synchronization of data from ARIS into ARIS Risk & Compliance Manager is canceled. The reports for semantic checks allow you to check data before synchronization to make sure that guidelines have been met. You can run the reports individually or run all the existing reports one after the other using a macro. You can use the resulting log to correct the modeling errors, which ensures that the synchronization to ARIS Risk & Compliance Manager is performed correctly. For a detailed description, from the conceptual design and modeling to the handling of synchronization, refer to the ARIS Risk & Compliance Manager conventions manual.

The following descriptions of the reports for semantics verifications are based on the standard definitions of the configuration file **ARCM-Semantics_Properties.js** and the reports.

RISK-BASED OR CONTROL-BASED MODELING

Modeling of the data for ARIS Risk & Compliance Manager can be risk-based or control-based. In the risk-based approach, the risk is the central object, while in the control-based approach, it is the control. The decision on which approach is used must be made at the beginning of a project while modeling in ARIS. The risk and the control-based approach are exclusive, that is, only one approach can be used within an ARIS Risk & Compliance Manager installation.

3 Use semantics reports

3.1 Installation of semantics reports

By default, the ARIS Risk & Compliance Manager semantics reports are available in the report category **ARIS Risk & Compliance Manager**. The master report **Check for compliance with ARIS Risk & Compliance Manager modeling conventions** executes all individual semantic reports.

3.2 Run semantics reports

There are two ways of executing the semantics reports (Page 7). You can run individual reports or launch the master report that executes all available reports consecutively.

RUN INDIVIDUAL REPORTS

When you run reports individually, you can verify for a specific object type whether the required attributes exist, whether they are valid, and whether the required object relationships exist.

Prerequisite

- You need the **Read** access privilege for the groups in which the database items are saved.
- The items were saved.
- You have access to this script. Access to scripts can be restricted to certain user groups.

Procedure

1. Start ARIS Architect.
2. Click **ARIS >** ▤ **Explorer**. The **Explorer** tab opens.
3. Click ⚙ **Navigation** in the bar panel if the **Navigation** bar is not activated yet.
4. Right-click the relevant object, model, or group.
5. Click **Evaluate > Start report**. The **Report Wizard** opens.
6. Select the **ARIS Risk & Compliance Manager** category and the relevant semantics report (**Verify semantics of …**).
7. Click **Next**.
8. Select the output settings.
9. Click **Finish**.
10. Select the modeling approach.
11. Click **OK**.

The report is started. The resulting report is output as a text file.

RUN ALL AVAILABLE REPORTS

When you launch the **Check for compliance with ARIS Risk & Compliance Manager modeling conventions** report, all available reports are processed in the defined sequence.

Procedure

1. Start ARIS Architect.
2. Click **ARIS >** ◧ **Explorer**. The **Explorer** tab opens.
3. Click ✿ **Navigation** in the bar panel if the **Navigation** bar is not activated yet.
4. Right-click the relevant group or database.
5. Click **Evaluate > Start report**. The **Report Wizard** opens.
6. Select the **ARIS Risk & Compliance Manager** category and the **Check for compliance with ARIS Risk & Compliance Manager modeling conventions** report.
7. Click **Next**.
8. Select the output settings.
9. Click **Finish**.
10. Select the modeling approach.
11. Click **OK**.

All available reports are started. The result is a cumulative report on the results of all individual reports that is output as a text file.

3.2.1 Example of a report without error messages

```
************************************************************
Error report on semantic verification of test definitions
************************************************************

No errors found.
```

3.2.2 Example of a report with error messages

```
************************************************************
Error report on semantics verification for hierarchy structures
************************************************************

Hierarchy structure of the "Regulations" checked. Contains errors!

Required attribute(s) not defined!!

    Technical term - (Untitled)
        Required attribute(s) not defined: AT_NAME
        Required attribute(s) not defined: AT_AAM_SIGN_OFF_RELEVANT

    Exists in:
        Group: 1.5 Regulations
        Model: Regulation hierarchy

Several parent nodes found!

    Technical term - (Untitled)
    Exists in:
        Group: 1.5 Regulations
        Model: Regulation hierarchy
            Parent 1: Technical term
            Parent 2: Regulations
```

4 Valuable information

This section provides background information about the procedures described.

4.1 What additional components do you need for the semantics reports?

The logic of the semantics verification (Page 3) is divided into four components.

THE REPORTS FOR PERFORMING THE RELEVANT VARIFICATIONS

- **Verify semantics of hierarchy structures**
- **Verify semantics of risks**
- **Verify semantics of controls**
- **Verify semantics of test definitions**
- **Verify semantics of users**
- **Verify semantics of user groups**
- **Verify semantics of questionnaire templates**
- **Verify semantics of audit templates**

THE JAVASCRIPT FILES THAT PROVIDE THE BASIC FUNCTIONALITY OF THE REPORTS AVAILABLE

- **arcm-common.js** (**Common files** section)
- **arcm-mapping.js** (**Common files** section)
- **aris2arcm-mapping.xml** (**Common files** section)
- **ARCM-Semantics_BaseDataFunctions.js**
- **ARCM-Semantics_BaseReportAndOutputFunctions.js**

THE JAVASCRIPT FILE FOR CONFIGURING THE VERIFICATIONS

- **ARCM-Semantics_Properties.js**

THE MASTER REPORT FOR EXECUTING ALL AVAILABLE REPORTS IN ONE STEP

The **Check for compliance with ARIS Risk & Compliance Manager modeling conventions** report runs all assigned reports, bundles the results and outputs them.

4.2 What reports are available for semantics verifications, and in what context can they be executed?

You can execute the semantics reports as follows:

Report	Context
Verify semantics of hierarchy structures	Group
Verify semantics of risks	Group
Verify semantics of controls	Group
Verify semantics of test definitions	Group
Verify semantics of user groups	Group
Verify semantics of users	Group
Verify semantics of questionnaire templates	Group
Verify semantics of survey tasks	Group
Verify semantics of audit templates	Group
Verify semantics of policies	Group

Macro	Context
Check for compliance with ARIS Risk & Compliance Manager modeling conventions	Database, group

4.3   What verifications are defined for audit templates?

This description relates to the default definition of the configuration file and reports.

REPORT NAME

Verify semantics of audit templates

VERIFICATIONS TO BE PERFORMED

The report verifies whether:

- the **Synchronize ARCM** attribute is set. Only audit templates for which this attribute is activated are considered.

- an audit is connected to exactly one audit owner group, exactly one audit reviewer group, and no more than one audit auditor group.

- an audit step is connected to exactly one audit step owner group.

- no more than one connection of the **is within the scope of** type exists for a hierarchy type in the model.

- an audit step is connected to exactly one superior audit step or exactly one audit via a connection of the **belongs to** type, so that a unique tree structure is provided.

- an audit template or an audit step template exists only once in a model.

- the start date of the preparation of an audit occurs before or is identical with the audit period.

- the audit step period occurs within the audit period or whether start and end date of audit step period and audit period are identical, with the end date of the audit period being calculated from the start date and maximum total time taking into consideration the value specified for the **Weekend off** attribute.

- the mandatory attributes for the following objects are specified:
    - **Audit template**:
        - **Name**
        - **Start date**
        - **Maximum total time**
        - **Start date of audit preparation**
        - **Start date of control period**
        - **End date of control period**
    - **Audit step template**:
        - **Name**
        - **Start date**
        - **Maximum total time**
        - **Required processing time**

- hierarchy types (risk category, application system type, function (process), organizational unit, or technical term) are connected to the task allocation diagram using the **is within the scope of** connection for the purpose of defining the scope of an audit template or audit step template.

- the value of the maximum total time and the relevant processing time is not 0000:00:00:00.

- the value of the relevant processing time does not exceed the value of the maximum total time.

4.4 What verifications are defined for controls?

This description relates to the default definition of the configuration file and reports.

REPORT NAME

Verify semantics for the controls

VERIFICATIONS TO BE PERFORMED

RISK-BASED MODELING

The report verifies whether:

- the required attributes are set:
    - **Name**
- the control is unique within the modeled business controls diagram.
- a control has an occurrence in no more than one business controls diagram.
- the controls are connected to a single risk for which the **Synchronize ARCM** attribute is set (does not apply if the verification was started on a risk diagram for which the **Synchronize ARCM** attribute is set).
- the controls are each connected to a maximum of one control manager group.

CONTROL-BASED MODELING

The report verifies whether:

- the required attributes are set:
    - **Name**
- the control is unique within the modeled business controls diagram.
- a control has an occurrence in no more than one business controls diagram.
- the **Synchronize ARCM** attribute is set. Only controls for which this attribute is activated are considered.
- the controls are each connected to a maximum of one control manager group.
- the controls are each connected to a maximum of one function. A tree is required to generate the process hierarchy, not a network structure.

RISK AND CONTROL-BASED MODELING

Verifies whether a control execution task is linked to the control. If so, verifies whether:

- the required attributes are set:
    - **Name** and
    - **Control documentation frequency** and
    - **Time limit for documentation of control execution in days** and
    - **Start date** and
    - **Length of documented period**

- a control execution task is linked to only one organizational unit.
- a control execution task is linked to only one group (there must be only one Control execution owner group).
- the **Event-driven control documentation allowed** attribute is set to **true**, when the value **Event-driven** is set for the control documentation frequency.
- the start date is before the end date.
- the control execution task is unique within the modeled business controls diagram.
- a control execution task has a single assigned control. A control can have multiple control execution tasks but each control execution task can only ever have one control.
- a control execution task occurs in no more than one business controls diagram.

4.5 What verifications are defined for hierarchy structures?

This description relates to the default definition of the configuration file and reports.

REPORT NAME

Verify semantics of hierarchy structures

CONTEXT

According to the default definition, the verification uses the hierarchy structures with the following models:

PROCESS

EPC, **Value-added chain diagram**, and **Function allocation diagram**

ORGANIZATIONAL UNIT

- **Organizational chart**

REGULATIONS

- **Technical terms model**

Special for Regulatory Change Management

The report verifies whether:

- the **Review-relevant** attribute is selected. If so, the following mandatory attributes and conditions are checked:
    - **Review frequency**
    - **Time limit for the execution of the review in days**
    - **Start date of review**
    - The technical term must be connected to precisely one hierarchy owner group.

TESTER

No models can be specified for the tester hierarchy. The models that were specified for the organizational unit are used.

APPLICATION SYSTEM TYPE

- **Application system type diagram**

RISK CATEGORY

- **Risk diagram**

VERIFICATIONS TO BE PERFORMED

The report verifies whether:

- the required attributes are specified for all hierarchy structures:

    - **Name**

- each element of the hierarchy has a maximum of one parent node.

- a hierarchy element is connected to no more than one sign-off owner group (not relevant for application system type and risk category hierarchy)

Only trees are permitted for structuring the hierarchy in ARIS Risk & Compliance Manager, no net structures.

SPECIAL FEATURE OF RISK-BASED MODELING

- The report verifies whether the **Synchronize ARCM** attribute is specified for the assigned risks. With processes, only objects are included to which a risk is assigned for which the **Synchronize ARCM** attribute is set.

- The report verifies whether there are overlaps between tester hierarchy and organizational hierarchy. An organizational unit must not belong to the tester hierarchy and the organizational hierarchy at the same time.

SPECIAL FEATURE OF CONTROL-BASED MODELING

The report verifies whether the **Synchronize ARCM** attribute is specified for the assigned controls. With processes, only objects are included to which a control is assigned for which the **Synchronize ARCM** attribute is set.

4.6   What verifications are defined for policy definitions?

This description relates to the default definition of the configuration file and reports.

REPORT NAME

Verify semantics of policies

(Object type name is **Policy** in ARIS, **policy definition** in ARIS Risk & Compliance Manager)

VERIFICATIONS TO BE PERFORMED

The report verifies whether:

- the **Synchronize ARCM** attribute is set. Only policy definitions for which this attribute is activated are considered.
- a policy definition is connected to exactly one policy owner group.
- a policy definition is connected to no more than one policy auditor group.
- at least one policy addressee group is connected if the policy is of the **Confirmation required** type.
- the publishing start date is after the start date of the publishing preparation period.
- the end date of the publishing period is after the start date of the publishing period.
- the end date of the publishing preparation period is after the start date of the publishing preparation period.
- the end date of the approval period is after the start date of the approval period.
- the approval period of the approvers is completely within the publishing preparation period of the owners.
- the mandatory attributes for the following objects are specified:
    - **Policy definition:**
        - **Name**
        - **Policy type**
        - **Start date of publishing preparation period**
        - **End date of publishing preparation period**
        - **End date of publishing period**
        - **Start date of approval period**
        - **End date of approval period**
        - **Confirmation duration** if the policy is of the **Confirmation required** type
    - **Policy review task**:
        - **Review frequency** if the policy is marked as review-relevant.
        - **Event-driven reviews allowed** if the policy is marked as review-relevant.
        - **Time limit for execution in days** if the policy is marked as review-relevant.
        - **Start date** if the policy is marked as review-relevant.

4.7 What verifications are defined for questionnaire templates?

This description relates to the default definition of the configuration file and reports.

REPORT NAME

Verify semantics of questionnaire templates

VERIFICATIONS TO BE PERFORMED

The report verifies whether:

- the **Synchronize ARCM** attribute is set. Only questionnaire templates for which this attribute is activated are considered.
- the mandatory attributes for the following objects are specified:
    - **Questionnaire template**:
        - **Name**
    - **Section**:
        - **Name**
    - **Question**:
        - **Question text** and
        - **Question type**:
            - **Single choice** or
            - **Multiple choice** or
            - **Text** or
            - **Numerical (integer)** or
            - **Numerical (floating point number)** or
            - **Date** or
            - **Date range**

            If the question type is **Single choice** or **Multiple choice**, then either an option set or at least one answer options must be assigned (mandatory fields).

            If the **Text**, **Numerical**, **Date**, or **Date range** question type is selected, the **Evaluation by reviewer** field becomes mandatory. If the **Evaluation by reviewer** attribute is set to **Yes**, then either an option set or an answer option must be assigned (mandatory fields).

            Several answer options or one option set can be assigned to a question. You cannot simultaneously assign answer options and an option set. The respective assignment must be removed before another one can be added.

- **Option set**:
    - **Name**
- **Answer option**:
    - **Answer**

- a question only occurs once in a section. It is, however, possible to use a question in different sections.

- an option set is always assigned at least one answer option.

- all connected survey tasks are connected to at least one interviewee group and precisely one survey reviewer group.

- all connected survey tasks are connected to a maximum of one survey manager group (the assignment is not mandatory).

- the mandatory attributes for these survey tasks are specified:
    - **Frequency**
    - **Start date**
    - **Time limit for execution in days**

4.8   What verifications are defined for risks?

This description relates to the default definition of the configuration file and reports.

REPORT NAME

Verify semantics of risks

VERIFICATIONS TO BE PERFORMED

RISK-BASED MODELING

The report verifies whether:

- the required attributes are set:
    - **Name**
- the **Synchronize ARCM** attribute is set. Only risks for which this attribute is activated are considered.
- a risk is connected to no more than one risk manager group.
- the risks are unique within the modeled business controls diagrams. A risk can have several controls, but a control can only have one risk.
- a risk has an occurrence in no more than one business controls diagram.
- the risks are each connected to a maximum of one function. A tree view is required to generate the process hierarchy, not a network structure.
- the **Risk Management-relevant** attribute is selected. If so, the following mandatory attributes and conditions are checked:
    - **Assessment frequency**
    - **Time limit for execution in days**
    - **Start date of risk assessments**
- the risk is assigned a single risk owner group and a single risk reviewer group.

CONTROL-BASED MODELING

The report verifies whether:

- the required attributes are set:
    - **Name**
- each risk is connected to at least one control for which the **Synchronize ARCM** attribute is specified.
- a risk is connected to no more than one risk manager group.
- a risk has an occurrence in no more than one business controls diagram.

- the **Risk Management-relevant** attribute is selected. If so, the following mandatory attributes and conditions are checked:

    - **Assessment frequency**

    - **Time limit for execution in days**

    - **Start date of risk assessments**

- the risk is assigned a single risk owner group and a single risk reviewer group.

- the risk is assigned to a maximum of one function.

4.9　　What verifications are defined for test definitions?

This description relates to the default definition of the configuration file and reports.

REPORT NAME

Verify semantics of test definitions

VERIFICATIONS TO BE PERFORMED

The report verifies whether:

- the required attributes are set:
    - **Name**
  - **Test type**:
    - **Test of design** and/or
    - **Test of effectiveness** and
  - **Test frequency** and
  - **Time limit for execution in days** (the value must be between 1 and 365) and
  - **Start date of test definition** and
  - **Length of control period**.
- the test definitions are unique within the modeled business controls diagram.
- a test definition has an occurrence in no more than one business controls diagram.
- the test definitions are each connected to precisely one tester group and one reviewer group, and then only if each group member is assigned to only one of the two groups.
- the test definitions are each connected to a maximum of one test manager group (the group assignment is not mandatory)
- the test definitions are each connected to precisely one organizational unit. Assignment to the organizational hierarchy is required in ARIS Risk & Compliance Manager.
- the tester group connected to the test definition is also connected to a single element of the tester hierarchy.
- the **Event-driven test cases allowed** attribute is set to **true**, when the value **Event-driven** is set for the test frequency.

SPECIAL FEATURE OF RISK-BASED MODELING

The report verifies whether:

- a test definition is connected to precisely one control that is itself connected to a risk for which the **Synchronize ARCM** attribute is specified.

SPECIAL FEATURE OF CONTROL-BASED MODELING

The report verifies whether:

- a test definition is connected to precisely one control for which the **Synchronize ARCM** attribute is specified.

4.10   What verifications are defined for user groups?

This description relates to the default definition of the configuration file and reports.

REPORT NAME

Verify semantics of user groups

VERIFICATIONS TO BE PERFORMED

The report verifies whether:

- the required attributes are set:
    - **Name**
- an object of the **Role** type is connected to more than one object of the **Role** type. A group can only have a single role in ARIS Risk & Compliance Manager. The report does not verify whether a group is connected to precisely one role, or whether a user group is connected to the **Tester** role with exactly one hierarchy element of the **Tester** type.

4.11   What verifications are defined for users?

This description relates to the default definition of the configuration file and reports.

REPORT NAME

Verify semantics of users

VERIFICATIONS TO BE PERFORMED

The report verifies whether:

- the required attributes are set:
    - **Login** and
    - **First name** and
    - **Last name** and
    - **E-mail address**
- the user ID consists of alphanumeric characters and period (**.**), hyphen (**-**) or underscore (**_**) only.

5 Legal information

5.1 Documentation scope

The information provided describes the settings and features as they were at the time of publishing. Since documentation and software are subject to different production cycles, the description of settings and features may differ from actual settings and features. Information about discrepancies is provided in the Release Notes that accompany the product. Please read the Release Notes and take the information into account when installing, setting up, and using the product.

If you want to install technical and/or business system functions without Software AG's consulting services, you require extensive knowledge of the system to be installed, its intended purpose, the target systems, and their various dependencies. Due to the number of platforms and interdependent hardware and software configurations, we can only describe specific installations. It is not possible to document all settings and dependencies.

When you combine various technologies, please observe the manufacturers' instructions, particularly announcements concerning releases on their Internet pages. We cannot guarantee proper functioning and installation of approved third-party systems and do not support them. Always follow the instructions provided in the installation manuals of the relevant manufacturers. If you experience difficulties, please contact the relevant manufacturer.

If you need help installing third-party systems, contact your local Software AG sales organization. Please note that this type of manufacturer-specific or customer-specific customization is not covered by the standard Software AG software maintenance agreement and can be performed only on special request and agreement.

If a description refers to a specific ARIS product, the product is named. If this is not the case, names for ARIS products are used as follows:

Name	Includes
ARIS products	Refers to all products to which the license regulations of Software AG standard software apply.
ARIS Clients	Refers to all programs that access shared databases via ARIS Server, such as ARIS Architect or ARIS Designer.
ARIS Download clients	Refers to ARIS clients that can be accessed using a browser.

5.2   Data protection

Software AG products provide functionality with respect to processing of personal data according to the EU General Data Protection Regulation (GDPR).

Where applicable, appropriate steps are documented in the respective administration documentation.

5.3   Disclaimer

ARIS products are intended and developed for use by people. Automatic processes such as generation of content and import of objects/artefacts using interfaces can lead to a huge data volume, processing of which may exceed the available processing capacity and physical limits. Physical limits can be exceeded if the available memory is not sufficient for execution of the operations or storage of the data.

Effective operation of ARIS Risk & Compliance Manager requires a reliable and fast network connection. A network with an insufficient response time reduces system performance and can lead to timeouts.

If ARIS products are used in a virtual environment, sufficient resources must be available to avoid the risk of overbooking.

The system has been tested in the **Internal control system** scenario with 400 users logged in simultaneously. It contains 2,000,000 objects. To guarantee adequate performance, we recommend operating with not more than 500 users logged in simultaneously. Customer-specific adaptations, particularly in lists and filters, have a negative impact on performance.

6 Index