



Semantics verification for exporting data

ARIS Risk & Compliance Manager
Version 9.7 - Service Release 1

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This document applies to ARIS Risk & Compliance Manager from version 9.7. Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

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1 Introduction

When modeling in ARIS, certain conventions must be adhered to. If these conventions are observed, the import of data from ARIS into ARIS Risk & Compliance Manager will be canceled.

The reports for semantic checks allow you to check data before exporting 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 import into ARIS Risk & Compliance Manager is performed correctly.

For a detailed description, from the conceptual design and modeling to the handling of exports, please refer to the conventions manuals.

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, i.e., only one approach can be used within an ARIS Risk & Compliance Manager installation.



2 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.`



3 Procedure

3.1 Install semantics reports

Carry out the steps (Page 7) necessary for installing the reports for semantics verification.

Requirements

- The installation media for ARIS Risk & Compliance Manager is placed in your computer's drive.
- The report category must carry the name **ARCMExport-SemanticsReport**, otherwise the macro **ARCMExport-ExecuteSemanticsReports.amx** cannot be run. Background: An identifier, consisting of the category name and the report's GUID, is assigned to every report during report import.

Procedure

1. Create a new category under Evaluations > Reports
 - a. In ARIS Architect, click **ARIS > Administration**. **Administration** opens.
 - b. Right-click **Evaluations > Reports** in the tree view.
 - c. Select **New > Category**.
 - d. Enter the name **ARCMExport-SemanticsReport**.
 - e. Click **OK**.

The new category **ARCMExport-SemanticsReport** is created.
2. Import the report files into the new category
 - a. Right-click the newly created category **ARCMExport-SemanticsReport** in the tree view.
 - b. Click **Import script**.
 - c. Select the following report files from your installation media:
 - **SemanticsReportRisks.arx**
 - **SemanticsReportControls.arx**
 - **SemanticsReportTestDefinitions.arx**
 - **SemanticsReportUsers.arx**
 - **SemanticsReportUserGroups.arx**
 - **SemanticsReportHierarchyStructures.arx**
 - **SemanticsReportQuestionnaireTemplates.arx**
 - **SemanticsReportAuditTemplates.arx**
 - **SemanticsMasterReport.arx**
 - d. Click **Open**.

The reports are imported into the **ARCMExport-SemanticsReport** category.



3. Import the JavaScript files
 - a. Click **Administration**.
 - b. Right-click **Evaluations > Common files** in the tree view.
 - c. Click **Import files**.
 - d. Hold down the **Shift key** and select the following files. They are located on the installation media in the **ARIS reports** directory and the **SemanticsReports** subdirectory.
 - **ARCM-Semantics_BaseDataFunctions.js**
 - **ARCM-Semantics_BaseReportAndOutputFunctions.js**
 - **ARCM-Semantics_Properties.js**
 - **ARCM-Export_ObjectClassification.js**
 - **ARCM-Util.js**
 - e. Click **Open**.

The JavaScript files are imported.

4. Create a new category under Evaluations > Macros
 - a. Right-click **Evaluations > Macros** in the tree view.
 - b. Select **New > Category**.
 - c. Enter a name, e.g. **ARCM**.
 - d. Click **OK**.

The new category **ARCM** is created.

5. Import the macro to run all available reports
 - a. Right-click your new category, e.g., **Evaluations > Macros > ARCM**, in the tree view.
 - b. Click **Import script**.
 - c. Select the **ARCMExport-ExecuteSemanticsReports.amx** macro from the installation media.
 - d. Click **Open**.

The macro is imported.



3.2 Execute semantics reports

There are two ways of executing the semantics reports (Page 8). You can execute individual reports or launch the macro that executes all available reports consecutively.

Execute individual reports

When you execute 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.

Procedure

1. In ARIS Architect, right-click the relevant model/object or group.
2. Click **Evaluate > Start report**.
3. Click the relevant report from the **ARCMExport-SemanticsReport** category.
4. Click **Next**.
5. Select the output settings.
6. Click **Finish**.

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

Execute all available reports

When you launch the **ARCMExport - Verify semantics** macro, all available reports are processed in the defined sequence.

Procedure

1. Right-click the relevant group in the ARIS tree structure.
2. Click **Evaluate > Start macro**.
3. Click **ARCMExport - Verify semantics**.
4. Click **Next**.
5. Select the output settings.
6. Click **Finish**.

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 of semantics verification for test definitions
*****
```

No errors found.



3.2.2 Example of a report with error messages

```
*****  
Error report of semantics verification for hierarchy structure elements  
*****
```

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: Regulations hierarchy
```

Several parent nodes found!

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



4 Valuable information

In this area you can obtain background information that support you in performing the procedures.

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

- **SemanticsReportHierarchyStructures.arx**
- **SemanticsReportRisks.arx**
- **SemanticsReportControls.arx**
- **SemanticsReportTestDefinitions.arx**
- **SemanticsReportUsers.arx**
- **SemanticsReportUserGroups.arx**
- **SemanticsReportQuestionnaireTemplates.arx**
- **SemanticsReportAuditTemplates.arx**

The JavaScript files that provide the basic functionality of the reports available

- **ARCM-Semantics_BaseDataFunctions.js**
- **ARCM-Semantics_BaseReportAndOutputFunctions.js**

The JavaScript file for configuring the verifications

- **ARCM-Semantics_Properties.js**

The macro and the related master report for executing all available reports in one step

The **ARCMExport-ExecuteSemanticsReports.amx** macro runs all assigned reports, bundles the results and outputs these with the **SemanticsMasterReport.arx** report.



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 the semantics of the hierarchy structures	Group
Verify the semantics of the risks	Group
Verify the semantics of the controls	Group
Verify the semantics of the test definitions	Group
Verify the semantics of the user groups	Group
Verify the semantics of the users	Group
Verify the semantics of the questionnaire templates	Group
Verify semantics of the survey tasks	Group
Verify the semantics of the audit templates	Group
Verify the semantics of the policy definitions	Group

Macro	Context
ARCMExport - Verify semantics	Group

4.3 What verifications are defined for hierarchy structures?

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

Report name

Verify the semantics of the hierarchy structures: **SemanticsReportHierarchyStructures.arx**

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 activities**
 - **Review frequency**
 - **Event-driven reviews allowed**
 - **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** and
 - **Sign-off-relevant** (not relevant for application system type and risk category hierarchy)
- each element of the hierarchy has a maximum of one parent node.
- a hierarchy element is connected to no more than one audit 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 **Export relevant** attribute is specified for the assigned risks. With processes, only objects are included to which an export-relevant risk is assigned.
- The report verifies whether there are overlaps between tester hierarchy and organizational hierarchy. An organizational unit may 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 **Export relevant** attribute is specified for the assigned controls. With processes, only objects are included to which an export-relevant control is assigned.

4.4 What verifications are defined for risks?

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

Report name

Verify the semantics of the risks: **SemanticsReportRisks.arx**

Verifications to be performed

Risk-based modeling

(*) If the risk type is **Financial reporting**, the **Impact**, **Probability** and **Assertions** attributes and the regulations become mandatory attributes. Otherwise, they are optional attributes.

The report verifies whether:

- the required attributes are set:
 - **Name** and
 - **Risk types**:
 - Financial reporting** (*) and/or
 - Compliance** and/or
 - Operations** and
 - **Description** and
 - **Impact** (*) and
 - **Probability** (*) and
 - **Assertions** (*):
 - Existence or occurrence** and/or
 - Completeness** and/or
 - Rights and obligations** and/or
 - Valuation or allocation** and/or



Presentation and disclosure

or

Not specified (must not be combined with any other option)

- the **Export relevant** 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 just one function. A tree view is required to generate the process hierarchy, not a network structure.
- the risks are each connected to at least one regulation hierarchy element. Assignment to the regulation hierarchy is required (*) in ARIS Risk & Compliance Manager.
- the **Risk management-relevant** attribute is selected. If so, the following mandatory attributes and conditions are checked:
 - **Assessment activities**
 - **Assessment frequency**
 - **Event-driven assessments allowed**
 - **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

(*) If the risk type is **Financial reporting**, the **Impact** and **Probability** attributes become mandatory attributes. Otherwise, they are optional attributes.

The report verifies whether:

- the required attributes are set:
 - **Name** and
 - **Risk types:**
 - Financial reporting** (*) and/or
 - Compliance** and/or
 - Operations** and
 - **Description** and
 - **Impact** (*) and
 - **Probability** (*)
- each risk is connected to at least one control for which the **Export relevant** 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 activities**
 - **Assessment frequency**
 - **Event-driven assessments allowed**
 - **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 a single function.

4.5 What verifications are defined for controls?

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

Report name

Verify the semantics of the controls: **SemanticsReportControls.arx**

Verifications to be performed

Risk-based modeling

The report verifies whether:

- the required attributes are set:
 - **Name** and
 - **Control frequency** and
 - **Control execution:**
 - Manual control** and/or
 - IT control** and
 - **Effect of control** and
 - **Control activities** and
 - **Key control**
- 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 **Export-relevant** attribute is specified (does not apply if the verification was started on a risk diagram marked as export-relevant).
- the controls are each connected to a maximum of one control manager group.
- the controls are each connected to at least one test definition.



Control-based modeling

The report verifies whether:

- the required attributes are set:
 - **Name** and
 - **Control frequency** and
 - **Control execution:**
 - Manual control** and/or
 - IT control** and
 - **Effect of control** and
 - **Control activities** and
 - **Key control**
 - **Assertions:**
 - Existence or occurrence** and/or
 - Completeness** and/or
 - Rights and obligations** and/or
 - Valuation or allocation** and/or
 - Presentation and disclosure**
 - or
 - **Not specified** (must not be combined with any other option)
- the control is unique within the modeled business controls diagram.
- a control has an occurrence in no more than one business controls diagram.
- the **Export relevant** 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 at least one test definition.
- the controls are each connected to a single function. A tree is required to generate the process hierarchy, not a network structure.
- the controls are each connected to at least one regulation hierarchy element. Assignment to the regulation hierarchy is required in ARIS Risk & Compliance Manager.



4.6 What verifications are defined for test definitions?

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

Report name

Verify the semantics of the test definitions: **SemanticsReportTestDefinitions.arx**

Verifications to be performed

The report verifies whether:

- the required attributes are set:
 - **Name** and
 - **Test activities** and
 - **Nature of test:**
 - Inquiry** and/or
 - Observation** and/or
 - Examination** and/or
 - Reperformance** and
 - **Test type:**
 - Test of design** and/or
 - Test of effectiveness** and
 - **Test size** and
 - **Test frequency** and
 - **Event-driven test cases allowed** 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** and
 - **Offset in days** and
 - **Follow-up**.
- 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 two groups (there must be exactly one tester group and one reviewer group), and whether each group member is assigned to only one of the two groups.
- 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, and vice versa.

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 **Export relevant** 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 **Export relevant** attribute is specified.

4.7 What verifications are defined for user groups?

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

Report name

Verify the semantics of the user groups: **SemanticsReportUserGroups.arx**

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.



4.8 What verifications are defined for users?

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

Report name

Verify the semantics of the users: **SemanticsReportUsers.arx**

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.

4.9 Which verifications are defined for questionnaire templates?

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

Report name

Verify the semantics of the questionnaire templates:

SemanticsReportQuestionnaireTemplate.arx

Verifications to be performed

The report verifies whether:

- the **Export relevant** 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 of answer by survey reviewer** box is a mandatory field. If the **Evaluation of answer by survey 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. The simultaneous assignment of answer options and the option set is impossible.

- **Option set:**
 - **Name**
- **Answer option:**
 - **Answer** and
 - **Answer value**
- a section is unique within a questionnaire template.
- a section can only be assigned to a maximum of one questionnaire template.
- 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.

4.10 What verifications are defined for survey tasks?

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

Report name

Verify semantics of the survey task: **SemanticsReportQuestionnaireTemplate.arx**

Verifications to be performed

The report verifies whether:

- the **Export relevant** attribute is set for the assigned survey template. Only those survey tasks are considered that are assigned to a questionnaire template that is marked as **Export relevant** in the Questionnaire template assignments diagram.
- a survey task is connected to at least one interviewee group and precisely one survey reviewer group.



- the mandatory attributes for the following object are specified:
 - **Survey task:**
 - **Frequency**
 - **Start date**
 - **Offset in days**
 - **Time limit for execution in days**
 - **Length of control period**

4.11 What verifications are defined for audit templates?

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

Report name

Verify the semantics of the audit template: **SemanticsReportAuditTemplate.arx**

Verifications to be performed

The report verifies whether:

- the **Export relevant** 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**
 - **Audit client**



- **Start date of audit preparation**
- **Start date of control period**
- **End date of control period**
- **Audit step template:**
 - **Name**
 - **Start date**
 - **Maximum total time**
 - **Desired processing time**
- hierarchy type, risk category, application system type, function (process), organizational unit, or technical term are connected to the task allocation diagram via 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.

4.12 What verifications are defined for policy definitions?

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

Report name

Verify the semantics of the policy definitions: **PolicyDefinition.arx**

Verifications to be performed

The report verifies whether:

- the **Export relevant** 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 approval period (owner).
- the end date of the publishing period is after the start date of the publishing period.
- the end date of the approval period (owner) is after the start date of the approval period (owner).
- the end date of the approval period (approver) is after the start date of the approval period (approver).
- the approval period of the approvers is completely within the approval period of the owners.



- the mandatory attributes for the following objects are specified:
 - **Policy definition:**
 - **Name**
 - **Policy type**
 - **Start date of approval period (owner)**
 - **End date of approval period (owner)**
 - **End date of publishing period**
 - **Start date of approval period (approver)**
 - **End date of approval period (owner)**
 - **Confirmation duration** if the policy is of the **Confirmation required** type (the value must be between 1 and 365)
 - **Confirmation text** if the policy is of the **Confirmation required** type.
 - **Policy review task:**
 - **Review activities** if the policy has been marked as review-relevant.
 - **Review frequency** if the policy has been marked as review-relevant.
 - **Event-driven reviews allowed** if the policy has been marked as review-relevant.
 - **Time limit for execution in days** if the policy has been marked as review-relevant.
 - **Start date** if the policy has been marked as review-relevant.



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