



Guide to Schematron Rules and Patterns

RevRecall Schematron Guide

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Chapter 1 - Introduction

1.1 - Purpose

This is an informative supplement for RevRecall. This guide is generated from the RevRecall Schematron rules and provides a consolidated reference for the business rules of this specification.

1.2 - Overview

Chapter 2 is a listing of all the numbered rules in RevRecall. For each rule, there is a rule description, a code description, and a code block with the Schematron rule.

Chapter 3 is a listing of abstract patterns used in RevRecall. The abstract patterns may be used in numbered rules or provided as reference for use in rules developed by users of RevRecall. Each abstract pattern has a code description and a code block with the abstract Schematron pattern.

Chapter 4 is a listing of the master ISM Schematron file with all of the imports of rules and patterns. Many of the rules and patterns listed in Chapters 3 and 4 rely on functions and variables defined in the master file.

Chapter 5 is a listing of rules that have been deleted.

1.3 - Schematron

The business rules for RevRecall are encoded using ISO Schematron. Schematron is a rule-based validation language that uses XML Path Language to make assertions about an XML document.

RevRecall uses the XSLT 2.0 implementation of Schematron by Rick Jelliffe (2010-04-14) as its reference implementation. The only available identifying descriptors for this implementation are the implementer's name and date of release. This implementation may be found at the following URL: <http://code.google.com/p/schematron/>.



Important

The Schematron rules in this specification use XSLT 2.0 query binding.

1.4 - Conformance

This guide is informative. The Schematron rules listed here are normative in the sense that they convey criteria that a document **MUST** adhere to, exactly as English may be used to convey normative criteria. It is not necessary for implementers to use the specific Schematron encoding in this specification. Implementers **MAY** use any encodings, tools, or languages desired to implement validation schemes for conformance to this specification. However, to conform to the specification, validation schemes **MUST** match the behavior of the reference Schematron implementation. That is, a validator **MUST** find a document valid *if and only if* the reference Schematron implementation would find the document valid according to RevRecall's Schematron rules.

Chapter 2 - Rules

All of the numbered Rules for RevRecall are listed in this section. These rules may depend on patterns defined in the Abstract Patterns section or on variables defined in the Schematron Schema section.

Rules identifiers are all of the format RevRecall-ID-XXXXX, with rule files named RevRecall_ID_XXXXX.sch. Any other heading indicates a supporting file that may influence a rule but is not actually a numbered rule.

2.1 - ../Rules/generalConstraints/RevRecall_ID_00001.sch

Rule Description

[RevRecall-ID-00001][Error] All elements in the RevRecall namespace except Link must have content.

Code Description

All elements in the RevRecall namespace except Link context="rr:*[not(local-name() = 'Link')]" must have content.

Schematron Code

```
<?ICEA pattern?>
<!-- Notices - Distribution Notice:
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-->
<sch:pattern id="RevRecall-ID-00001">
    <sch:rule context="rr:*[not(local-name() = 'Link')]">
        <sch:assert test="normalize-space(.)" flag="error">[RevRecall-ID-00001][Error] All elements in the RevRecall namespace except Link must have content.</sch:assert>
    </sch:rule>
</sch:pattern>
```

2.2 - ../Rules/generalConstraints/RevRecall_ID_00003.sch

Rule Description

[RevRecall-ID-00003][Error] All xlink attributes on RevRecall elements must have non-whitespace values.

Code Description

All attributes in the xlink namespace that are on elements in the RevRecall namespace must have non-empty, non-whitespace values.

Schematron Code

```
<?ICEA pattern?>
<!-- Notices - Distribution Notice:
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-->
<sch:pattern id="RevRecall-ID-00003">
    <sch:rule context="rr:*[@xlink:*]">
        <sch:assert test="every $attr in @xlink:* satisfies normalize-space($attr) != ''"
                    flag="error">[RevRecall-ID-00003][Error] All xlink attributes on elements in the RevRecall namespace must have non-empty, non-whitespace values.</sch:assert>
    </sch:rule>
</sch:pattern>
```

2.3 - ../Rules/generalConstraints/RevRecall_ID_00004.sch

Rule Description

[RevRecall-ID-00004][Error] A RevRecall assertion must contain an ActionInstruction element if @action="MANUAL_INSTRUCTION".

Code Description

A RevRecall assertion must contain an ActionInstruction element if @action="MANUAL_INSTRUCTION".

Schematron Code

```
<?ICEA pattern?>
<!-- Notices - Distribution Notice:
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-->
<sch:pattern id="RevRecall-ID-00004">
    <sch:rule context="rr:*[contains(@rr:action, 'MANUAL_INSTRUCTION')]">
        <sch:assert test="child::rr:ActionInstruction" flag="error">[RevRecall-ID-00004][Error] A RevRecall assertion must contain an ActionInstruction element if
@action="MANUAL_INSTRUCTION".</sch:assert>
    </sch:rule>
</sch:pattern>
```

2.4 - ../Rules/generalConstraints/RevRecall_ID_00005.sch

Rule Description

[RevRecall-ID-00005][Error] A RevRecall assertion must not contain an ActionInstruction element unless @action="MANUAL_INSTRUCTION".

Code Description

A RevRecall assertion must not contain an ActionInstruction element unless @action="MANUAL_INSTRUCTION".

Schematron Code

```
<?ICEA pattern?>
<!-- Notices - Distribution Notice:
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-->
<sch:pattern id="RevRecall-ID-00005">
    <sch:rule context="rr:ActionInstruction">
        <sch:assert test="parent::node()[contains(@rr:action, 'MANUAL_INSTRUCTION')]"
                    flag="error">[RevRecall-ID-00005][Error] A RevRecall assertion must not contain an ActionInstruction element unless @action="MANUAL_INSTRUCTION".</
sch:assert>
    </sch:rule>
</sch:pattern>
```

2.5 - ../Rules/generalConstraints/RevRecall_ID_00006.sch

Rule Description

[RevRecall-ID-00006][Error] Revision Recall assertions must not have sibling Revision Recall assertions.

Code Description

Given the context of a RevRecall assertion that has a sibling RevRecall assertion, fail. Failing in this context generates errors for a TDO/TDC with multiple RevRecall assertions. The context explicitly restricts this rule to the TDF skeleton and does not look in TDF extension points which includes structured payloads and structured content of regular assertions. Currently, only respecting RevRecall HandlingAssertions in the main TDF structure is mandatory.

NOTE: The explicit path to rr:RevisionRecall is used in the predicates instead of descendent::rr:RevisionRecall to limit the search. Therefore, RevRecall assertions must satisfy tdf:HandlingAssertion/tdf:HandlingStatement/rr:RevisionRecall in order to trip this rule.

Schematron Code

```
<?ICEA pattern?>
<!-- Notices - Distribution Notice:
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-->
<sch:pattern id="RevRecall-ID-00006">
  <sch:rule context="tdf:HandlingAssertion[tdf:HandlingStatement/rr:RevisionRecall and ( preceding-sibling::tdf:HandlingAssertion[tdf:HandlingStatement/rr:RevisionRecall] or
following-sibling::tdf:HandlingAssertion[tdf:HandlingStatement/rr:RevisionRecall] )]">
    <sch:assert test="false()" flag="error">[RevRecall-ID-00006][Error] Revision Recall assertions must not have sibling Revision Recall assertions.</sch:assert>
  </sch:rule>
</sch:pattern>
```

2.6 - ../Rules/generalConstraints/RevRecall_ID_00007.sch

Rule Description

[RevRecall-ID-00007][Error] RevRecall assertions must have @tdf:scope with the value "TDO".

Code Description

Given a Revision Recall handling assertion -- context="tdf:HandlingAssertion[child::tdf:HandlingStatement/rr:RevisionRecall]" -- assert that there exists @tdf:scope with the value "TDO"

Schematron Code

```
<?ICEA pattern?>
<!-- Notices - Distribution Notice:
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-->
<sch:pattern id="RevRecall-ID-00007">
    <sch:rule context="tdf:TrustedDataObject/tdf:HandlingAssertion[child::tdf:HandlingStatement/rr:RevisionRecall]">
        <sch:assert test="@tdf:scope = 'TDO'" flag="error">[RevRecall-ID-00007][Error] RevRecall assertions must have @tdf:scope with the value "TDO".</sch:assert>
    </sch:rule>
</sch:pattern>
```

2.7 - ../Rules/generalConstraints/RevRecall_ID_00008.sch

Rule Description

[RevRecall-ID-00008][Error] For a Trusted Data Collection, RevRecall assertions must have @tdf:scope="TDC".

Code Description

Given a Revision Recall handling assertion for a TDC -- context="tdf:HandlingAssertion[child::tdf:HandlingStatement/rr:RevisionRecall]" -- assert that there exists @tdf:scope with the value "TDC"

Schematron Code

```
<?ICEA pattern?>
<!-- Notices - Distribution Notice:
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-->
<sch:pattern id="RevRecall-ID-00008">
    <sch:rule context="tdf:TrustedDataCollection/tdf:HandlingAssertion[child::tdf:HandlingStatement/rr:RevisionRecall]">
        <sch:assert test="@tdf:scope = 'TDC'" flag="error">[RevRecall-ID-00008][Error] RevRecall assertions must have @tdf:scope with the value "TDC".</sch:assert>
    </sch:rule>
</sch:pattern>
```

2.8 - ../Rules/generalConstraints/RevRecall_ID_00009.sch

Rule Description

[RevRecall-ID-00009][Error] Revision Recall assertions must be Handling Assertions.

Code Description

The RevisionRecall element must be the grandchild of a HandlingAssertion element. This rule is tested from the RevisionRecall context to ensure that non-compliant assertions are flagged.

Schematron Code

```
<?ICEA pattern?>
<!-- Notices - Distribution Notice:
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-->
<sch:pattern id="RevRecall-ID-00009">
    <sch:rule context="rr:RevisionRecall">
        <sch:assert test="../parent::tdf:HandlingAssertion" flag="error">[RevRecall-ID-00009][Error] Revision Recall assertions must be Handling Assertions.</sch:assert>
    </sch:rule>
</sch:pattern>
```

2.9 - ../Rules/generalConstraints/RevRecall_ID_00010.sch

Rule Description

[RevRecall-ID-00010][Error] Attribute rr:dateTime of type xs:dateTime must have a timezone. Human Readable: The RevRecall attribute dateTime must have a timezone.

Code Description

The RevRecall attribute rr:dateTime must have a timezone. According to <http://www.w3.org/TR/xmlschema-2/#dateTime>, datetime is represented by: '-'? yyyy '-' mm '-' dd 'T' hh ':' mm ':' ss ('.' s+)? (zzzzzz)? where the timezone zzzzzz is represented by: (('+' | '-') hh ':' mm) | 'Z' This rule enforces and makes the timezone zzzzzz mandatory.

Schematron Code

```
<?ICEA pattern?>
<!-- Notices - Distribution Notice:
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-->
<sch:pattern id="RevRecall-ID-00010">
    <sch:rule context="rr:RevisionRecall">
        <sch:assert test="matches(@rr:dateTime, '^-\d{4}-\d{2}-\d{2}T\d{2}:\d{2}:\d{2}(\.\d+)?(((\+|-)\d{2}:\d{2})|Z)$')"
            flag="error">[RevRecall-ID-00010][Error] Attribute rr:dateTime of type xs:dateTime must have a timezone. Human Readable: The RevRecall attribute dateTime
must have a timezone.</sch:assert>
    </sch:rule>
</sch:pattern>
```

Chapter 3 - Abstract Patterns

There are no Abstract Patterns currently defined for RevRecall.

Chapter 4 - Schematron Schema

The top level Schematron file for RevRecall is in this section. This file imports all of the others and also defines many global variables they are all dependent on.

4.1 - ../RevRecall_XML.sch

Schematron Code

```
<?ICEA master?>
<!-- Notices - Distribution Notice:
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-->
<sch:schema queryBinding="xslt2">
    <sch:ns uri="urn:us:gov:ic:revrecall" prefix="rr"/>
    <sch:ns uri="http://www.w3.org/1999/xlink" prefix="xl"/>
    <sch:ns prefix="tdf" uri="urn:us:gov:ic:tdf"/>
    <!--*****--><!-- (U) RevRecall ID Rules --><!--*****--><!--(U) generalConstraints-->
<sch:include href="../Rules/generalConstraints/RevRecall_ID_00001.sch"/>
    <sch:include href="../Rules/generalConstraints/RevRecall_ID_00003.sch"/>
    <sch:include href="../Rules/generalConstraints/RevRecall_ID_00004.sch"/>
    <sch:include href="../Rules/generalConstraints/RevRecall_ID_00005.sch"/>
    <sch:include href="../Rules/generalConstraints/RevRecall_ID_00006.sch"/>
    <sch:include href="../Rules/generalConstraints/RevRecall_ID_00007.sch"/>
    <sch:include href="../Rules/generalConstraints/RevRecall_ID_00008.sch"/>
    <sch:include href="../Rules/generalConstraints/RevRecall_ID_00009.sch"/>
    <sch:include href="../Rules/generalConstraints/RevRecall_ID_00010.sch"/>
</sch:schema>
```

Chapter 5 - Removed Rules

All of the numbered Rules for RevRecall that have been removed are listed in this section. This section is just a reference for what rule numbers have been dropped. In many but not all cases there will be a reason listed. In all cases the version that the rule was dropped in is listed.

5.1 - `./Rules/deleted/RevRecall_ID_00002.sch`

Rule Description

[RevRecall-ID-00002][Error] Rule removed in 2014-DEC (201412). Rule context covered by check for schema validity.