



Guide to Schematron Rules and Patterns

ARH Schematron Guide

Version 3

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Chapter 1 - Introduction

1.1 - Purpose

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

1.2 - Schematron

The business rules for the ARH specification are encoded using ISO Schematron. Schematron is a rule-based validation language that uses XML Path Language to make assertions about an XML document. While the business rules are normative, the use of Schematron to express the rules is informative.

1.3 - Conformance

This guide and the use of Schematron in the ARH specification is informative. Systems may validate documents against the business rules in the specification using any tools or languages that meet the needs of the system. However, to conform to the ARH 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 ARH's Schematron rules.

Chapter 2 - Rules

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

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

2.1 - ../Rules/generalConstraints/ARH_ID_00001.sch

Rule Description: ARH-ID-00001 [ARH-ID-00001][Error] The ARH elements cannot be used as root elements. Human Readable: ARH is not designed to stand-alone and therefore should never be used as a root element.

Code Description: We make sure that ARH:Security or ARH:ExternalSecurity are not used as the root element.

Schematron Code:

```
<?ICEA pattern?><!-- Notices - Distribution Notice:
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    available for use without restriction.
-->
<sch:pattern id="ARH-ID-00001">

    <sch:rule context="/arh:*">
        <sch:assert test="false()" flag="error">
            [ARH-ID-00001][Error] The ARH elements cannot be used as root
elements.

            Human Readable: ARH is not designed to stand-alone and therefore
should never
            be used as a root element.
        </sch:assert>
    </sch:rule>
</sch:pattern>
```

2.2 - ../Rules/generalConstraints/ARH_ID_00002.sch

Rule Description: ARH-ID-00002 [ARH-ID-00002][Error] The attribute DESVersion in the namespace urn:us:gov:ic:arh must be specified. Human Readable: The data encoding specification version number must be specified.

Code Description: Make sure that the attribute arh:DESVersion is specified.

Schematron Code:

```
<?ICEA pattern?><!-- Notices - Distribution Notice:
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    available for use without restriction.
-->
<sch:pattern id="ARH-ID-00002">

    <sch:rule context="/">
        <sch:assert test="some $element in descendant-or-
self::node() satisfies $element/@arh:DESVersion"
                    flag="error">
            [ARH-ID-00002][Error] The attribute
            DESVersion in the namespace urn:us:gov:ic:arh must be specified.

            Human Readable: The data encoding specification version must
            be specified.
        </sch:assert>
    </sch:rule>
</sch:pattern>
```

2.3 - ../Rules/generalConstraints/ARH_ID_00003.sch

Rule Description: ARH-ID-00003 [ARH-ID-00003][Error] Every ARH attribute in the document must be specified with a non-whitespace value. Human Readable: All attributes in the ARH namespace must specify a value.

Code Description: For each element which specifies an attribute in the ARH namespace, we make sure that all attributes in the ARH namespace contain a non-whitespace value.

Schematron Code:

```
<?ICEA pattern?><!-- Notices - Distribution Notice:
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-->
<sch:pattern id="ARH-ID-00003">

    <sch:rule context="*[@arh:*]">
        <sch:assert test="every $attribute in @arh:*
satisfies          string-length(normalize-space(string($attribute))) >
0"
                                flag="error">
            [ARH-ID-00003][Error] Every ARH attribute in the document must be
specified with a non-whitespace value.

            Human Readable: All attributes in the ARH namespace must specify
a value.
        </sch:assert>
    </sch:rule>
</sch:pattern>
```


2.4 - ../Rules/generalConstraints/ARH_ID_00004.sch

Rule Description: ARH-ID-00004 [ARH-ID-00004][Error] The @ntk:DESVersion is less than the minimum version allowed: 7. Human Readable: The NTK version imported by ARH must be greater than 7.

Code Description: For all elements that contain @ntk:DESVersion, we verify that the version is greater than the minimum allowed version: 7.

Schematron Code:

```
<?ICEA pattern?><!-- Notices - Distribution Notice:
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    available for use without restriction.
-->
<sch:pattern id="ARH-ID-00004">

    <sch:rule context="*[@ntk:DESVersion]">
        <sch:assert test="number(@ntk:DESVersion) >= 7"
flag="error">
            [ARH-ID-00004][Error] The @ntk:DESVersion is less than the
minimum version
            allowed: 7.

            Human Readable: The NTK version imported by ARH must be greater
than 7.
        </sch:assert>
    </sch:rule>
</sch:pattern>
```

2.5 - ../Rules/generalConstraints/ARH_ID_00005.sch

Rule Description: ARH-ID-00005 [ARH-ID-00005][Error] The @ism:DESVersion is less than the minimum version allowed: 12. Human Readable: The ism version imported by ARH must be greater than or equal to 12.

Code Description: For all elements that contain @ism:DESVersion, we verify that the version is greater than or equal to the minimum allowed version: 12.

Schematron Code:

```
<?ICEA pattern?><!-- Notices - Distribution Notice:
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    available for use without restriction.
-->
<sch:pattern id="ARH-ID-00005">

    <sch:rule context="*[@ism:DESVersion]">
        <sch:assert test="number(@ism:DESVersion) >= 12"
flag="error">
            [ARH-ID-00005][Error] The @ism:DESVersion is less than the
minimum version
            allowed: 12.

            Human Readable: The ism version imported by ARH must be greater
than or equal to 12.
        </sch:assert>
    </sch:rule>
</sch:pattern>
```

Chapter 3 - Abstract Patterns

There are no Abstract Patterns currently defined for ARH.

Chapter 4 - Schematron Schema

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

4.1 - ../ARH_XML.sch

Rule Description:

Code Description:

Schematron Code:

```
<?ICEA master?><!-- Notices - Distribution Notice:
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    to Federal, State, Local, Tribal, and Foreign Partners and
associated contractors. Approval for
    any further distribution must be coordinated via the Intelligence
Community Chief Information
    Officer, Mission Engagement Division at standardssupport@dni.gov--
>
<sch:schema queryBinding="xslt2">
    <sch:ns uri="urn:us:gov:ic:pubs" prefix="pubs"/>
    <sch:ns uri="urn:us:gov:ic:cve" prefix="cve"/>
    <sch:ns uri="http://www.w3.org/1999/xlink" prefix="xlink"/>
    <sch:ns uri="urn:us:gov:ic:ism" prefix="ism"/>
    <sch:ns uri="urn:us:gov:ic:ntk" prefix="ntk"/>
    <sch:ns uri="urn:us:gov:ic:arh" prefix="arh"/>
    <sch:ns uri="http://www.w3.org/2001/XMLSchema" prefix="xs"/>

    <!--*****-->
<!-- (U) ARH ID Rules -->
<!--*****-->

<!--(U) generalConstraints-->
    <sch:include href="../Rules/generalConstraints/ARH_ID_00001.sch"/>
    <sch:include href="../Rules/generalConstraints/
ARH_ID_00002.sch"/>
    <sch:include href="../Rules/generalConstraints/
ARH_ID_00003.sch"/>
    <sch:include href="../Rules/generalConstraints/
ARH_ID_00004.sch"/>
    <sch:include href="../Rules/generalConstraints/
ARH_ID_00005.sch"/>
    </sch:schema>
```

Chapter 5 - Removed Rules

There are no rules that have been removed for ARH.