**ECF5 ID and IDREF Rules**

This document addresses draft ECF5 rules which have been proposed to supplement the NIEM rules contained in the [NIEM NDR] ([*https://reference.niem.gov/niem/specification/naming-and-design-rules/3.0/NIEM-NDR-3.0-2014-07-31.html*](https://reference.niem.gov/niem/specification/naming-and-design-rules/3.0/NIEM-NDR-3.0-2014-07-31.html)) The NIEM rules are in section 12.2 ‘Reference elements’, in the NDR.

As raised in the feedback document 4, the some ID/IDREF issues do not appear to be addressed by the existing NIEM rules. To address this, the following was suggested:

* Specify that circular references are not permitted (this would also require defining exactly what it means to be circular).
* Define in the specification, standardized id/ref relationships and what they mean. For example, when an element of nc:PersonType references another element of nc:PersonType (using structures:ref), then this means the very same person is being referred to..
* Provide guidance on non-specification standardized id/ref relationships.
* Require non-specification standardized id/ref relationships to be defined in court policy.

**Circular references**

In feedback document 3, item #4, a circular reference example was presented, as shown below:

 <j:CaseInitiatingParty>

 <nc:EntityPerson structures:id="Person1" structures:ref="Person2"/>

 <j:CaseRespondentParty>

 <nc:EntityPerson structures:id="Person2" structures:ref="Person1"/>

Are circular references are only possible when an element has both structures:id and structures:ref?

There does not appear to be any NIEM rule the prohibits an element from having both a structures:id attribute and a structures:ref attribute. However, there is a NIEM rule (i.e. 12-2) that prohibits an element from having content if it has a structures:ref attribute. Although this does not prevent situations such as in the above example, from a practical point of view, it may eliminate most or maybe all questionable circular references.

However, consider the following example:

 <j:CaseInitiatingParty>

 <nc:EntityPerson structures:id="Person1" structures:ref="Person2"/>

 <j:CaseRespondentParty>

 <nc:EntityPerson structures:id="Person2">

 <nc:PersonName>

 <nc:PersonGivenName>Jane</nc:PersonGivenName>

 <nc:PersonSurName>Doe</nc:PersonSurName>

 </nc:PersonName>

I am not sure what this XML is trying to say (perhaps that the case initiating party is the very same person as the case respondent party, i.e. Jane Doe) but it is not circular.

So it seems that it may not be appropriate to establish a rule that prohibits an element from having both structures:id and structures:ref.

So for starters, it seems we should at least define a rule that prohibits an element from referencing itself, as shown below:

 <j:CaseInitiatingParty>

 <nc:EntityPerson structures:id="Person1" structures:ref="Person1">

This rule may be stated as:

A reference element must not reference itself.

More complex circular relationships could be prohibited with the following proposed rule:

Circular references, in which a reference element references other reference elements which ultimately refer back to the original reference element (e.g. through a chain of references), are not permitted.

Example:

 <j:CaseInitiatingParty>

 <nc:EntityPerson structures:id="Person1" structures:ref="Person2"/>

 <j:CaseRespondentParty>

 <nc:EntityPerson structures:id="Person2" structures:ref="Person3"/>

 <j:CaseDefendantParty>

 <nc:EntityPerson structures:id="Person3" structures:ref="Person1"/>

**Specification Standardized id/ref Relationships**

The concern is that when one element references another element the purpose or meaning of the reference is not clearly defined. This could lead to different interpretations as to the nature or purpose of the relationship. This could have interoperability consequences.

However,

NIEM rule 12-6 states: ‘There MUST NOT be any differences in meaning between a relationship established via an element declaration instantiated as a content element and that element declaration instantiated as a reference element.”

The NDR further provides the following clarification:

“There is no difference in meaning between relationships established by content elements and those established by reference elements. They are simply two mechanisms for expressing connections between objects. Neither mechanism implies that properties are intrinsic or extrinsic; such characteristics must be explicitly stated in property definitions.”

The NDR provides the following examples in illustration:

Figure 12-3: Example with a backward reference

<nc:Person structures:id="c58">

 <nc:PersonName>

 <nc:PersonFullName>John Doe</nc:PersonFullName>

 </nc:PersonName>

</nc:Person>

<j:Witness>

 <nc:RoleOfPerson structures:ref="c58"/>

</j:Witness>

Figure 12-4: Example with a forward reference

<nc:Person structures:ref="t85"/>

<j:Witness>

 <nc:RoleOfPerson structures:id="t85">

 <nc:PersonName>

 <nc:PersonFullName>John Doe</nc:PersonFullName>

 </nc:PersonName>

 </nc:RoleOfPerson>

</j:Witness>

The NIEM examples in Figures 12-3 and 12-4 have the exact same meaning (e.g. the witness is a person named John Doe).

So it seems, as implied by the NIEM NDR, that a reference has the meaning “is the same as”.

As such, the three bullets above regarding specification standardized and non-standardized ID/IDREF relationships appears unneeded. The ID/IDREF relationship always means “is the same as”, and if it does not, then it is disallowed by NIEM rule 12-6.

**Summary:**

It appears that only two additional ID/IDREF rules may be appropriate for ECF5 above and beyond those provided in the NIEM NDR.

Since these id/ref rules apply to all XML/messages, a new section may need to be added, such as 6.5 Other Rules (note: in the NDR, these ID/IDREF rules are in section 12 XML Instance document rules).

Here is a draft of what this section might contain:

**6.5 Other Rules**

6.4.1 Element Reference Rules

In this specification, the term ‘reference’ or ‘references’, is often used to describe a relationship between elements. For example, in section 6.2.8 Filer and Party Identifiers, it states: “Attorney elements MAY reference the parties they represent with party identifiers.”

Not all uses of the term “reference’ or “references” in this specification describe element references.

For element references, there are two methods supported by this specification. The first method is element reference by element content. The second method is element reference by the use of “reference elements” as described in [NIEM NDR] section 12.2 Reference elements.

6.4.1.1 Element Content References

References between elements by element content is used to establish relationships between data objects that is not expressed by the element tree structure (e.g. that of a child element to its outer parent element).

With element content references, an element value in one data object, such as an identifier value, is set as the element value in a different data object. The fact that these two different data objects contain elements with matching values establishes the association.

For example, to identify the case parties represented by an attorney using party identifiers, is illustrated in the following example:

First the party must be provided a party identifier value, such as ecf:FilingPartryID/nc:IdentificationID:

 <j:CaseInitiatingParty>

 <nc:EntityPerson structures:id="Person1">

 <nc:PersonName>

 <nc:PersonGivenName>John</nc:PersonGivenName>

 <nc:PersonSurName>Doe</nc:PersonSurName>

 </nc:PersonName>

 <ecf:PersonAugmentation>

 <ecf:CaseParticipantRoleCode>Defendant</ecf:CaseParticipantRoleCode>

 <ecf:FilingPartyID>

 <nc:IdentificationID>10</nc:IdentificationID>

 </ecf:FilingPartyID>

 </ecf:PersonAugmentation>

 </nc:EntityPerson>

 </j:CaseInitiatingParty>

 Secondly, the attorney must be elaborated:

 <j:CaseInitiatingAttorney>

 <nc:RoleOfPerson structures:id="Person3">

 <nc:PersonName>

 <nc:PersonGivenName>Jack</nc:PersonGivenName>

 <nc:PersonSurName>Jones</nc:PersonSurName>

 </nc:PersonName>

 </nc:RoleOfPerson>

 <j:JudicialOfficialBarMembership>

 <j:JudicialOfficialBarIdentification>

 <nc:IdentificationID>100001</nc:IdentificationID>

 </j:JudicialOfficialBarIdentification>

 </j:JudicialOfficialBarMembership>

 <ecf:CaseOfficialAugmentation>

 <ecf:CaseParticipantRoleCode>Attorney</ecf:CaseParticipantRoleCode>

 </ecf:CaseOfficialAugmentation>

 </j:CaseInitiatingAttorney>

And finally, the attorney to party relationship can be described:

 <j:CaseOfficial>

 <nc:RoleOfPerson structures:ref="Person3" xsi:nil="true"/>

 <ecf:CaseOfficialAugmentation>

 <ecf:CaseRepresentedParty>

 <nc:EntityPerson>

 <ecf:PersonAugmentation>

 <ecf:CaseParticipantRoleCode>Defendant

</ecf:CaseParticipantRoleCode>

 <ecf:FilingPartyID>

 <nc:IdentificationID>10</nc:IdentificationID>

 </ecf:FilingPartyID>

 </ecf:PersonAugmentation>

 </nc:EntityPerson>

 </ecf:CaseRepresentedParty>

 </ecf:CaseOfficialAugmentation>

 </j:CaseOfficial>

Relationships established using element content references are not validated using schema validation.

Relationships may be established between elements and data objects of different types.

6.4.1.2 Reference Elements

Reference elements are defined and described in [NIEM NDR] section 12.2 Reference elements. Essentially, a reference element is any element that uses the structures:ref attribute. In the example in the prior section, the nc:RoleOfPerson element is a reference element.

When using reference elements, the rules of the [NIEM NDR] apply. Implementers should be especially aware of rules 12-2, 12-3, 12-4, 12-5 and 12-6.

This specification extends these NIEM rules with the following additional rules:

A reference element must not reference itself.

Example – this example shows a prohibited self-reference:

 <j:CaseInitiatingParty>

 <nc:EntityPerson structures:id="Person1" structures:ref="Person1">

Circular references, in which a reference element references other reference elements which ultimately refer back to the original reference element (e.g. through a chain of references), are not permitted.

Example – this example shows a prohibited complex circular relationship:

 <j:CaseInitiatingParty>

 <nc:EntityPerson structures:id="Person1" structures:ref="Person2"/>

 <j:CaseRespondentParty>

 <nc:EntityPerson structures:id="Person2" structures:ref="Person3"/>

 <j:CaseDefendantParty>

 <nc:EntityPerson structures:id="Person3" structures:ref="Person1"/>

Reference elements SHOULD use the xsi:nil attribute set to the value “true”.

Although the [NIEM NDR] is the normative reference for [NIEM NDR] rules including rules 12-2, 12-3, 12-4, 12-5 and 12-6, the following informative guidance is provided:

NIEM NDR Rule 12-2 Element with structures:ref does not have content – An element that has attribute structures:ref MUST Not have element or text content.

Example 1, the following is valid:

 <nc:DocumentSubmitter>

 <nc:EntityPerson structures:ref="Person2" xsi:nil="true"/>

</nc:DocumentSubmitter>

Example 2, the following is not valid per [NIEM NDR] rule 12-2 (but is valid per schema since the xsi:nil attribute is absent):

 <nc:DocumentSubmitter>

 <nc:EntityPerson structures:ref="Person2">

 <j:PersonHairColorCode>BLU</j:PersonHairColorCode>

 </nc:EntityPerson>

</nc:DocumentSubmitter>

NIEM NDR Rule 12-5 Attribute structures:ref references element of correct type – Every element that has an attribute structures:ref MUST have a referencing element type definition that is validly derived from the referenced element type definition.

“This rule requires that the type of the element information item pointed to by a structures:ref attribute must be of (or derived from) the type that is specified by the element declaration of the reference element.”

For example, element nc:Person could contain a structures:ref attribute that pointed to another nc:Person element or could also point to an nc:RoleOfPerson element since both nc:Person and nc:RoleOfPerson are of type nc:PersonType.

Example 1 – the following is valid:

 <nc:DocumentSubmitter>

 <nc:EntityPerson structures:ref="Person2" xsi:nil="true"/>

</nc:DocumentSubmitter>

 <j:CaseRespondentParty>

 <nc:EntityPerson structures:id="Person2">

 <nc:PersonName>

 <nc:PersonGivenName>Jane</nc:PersonGivenName>

 <nc:PersonSurName>Doe</nc:PersonSurName>

 </nc:PersonName>

Example 2 – the following is not valid; j:CaseRespondentParty is type nc:EntityType and not nc:PersonType :

 <nc:DocumentSubmitter>

 <nc:EntityPerson structures:ref="Person2" xsi:nil="true"/>

</nc:DocumentSubmitter>

 <j:CaseRespondentParty structures:id="Person2">

 <nc:EntityPerson>

 <nc:PersonName>

 <nc:PersonGivenName>Jane</nc:PersonGivenName>

 <nc:PersonSurName>Doe</nc:PersonSurName>

 </nc:PersonName>

NIEM NDR Rule 12-6 Reference and content elements have the same meaning - There MUST NOT be any difference in meaning between a relationship established via an element declaration instantiated as a content element and that element declaration instantiated as a reference element.

This rule asserts that the two following examples have the same meaning:

Example 1 – forward reference:

 <nc:DocumentSubmitter>

 <nc:EntityPerson structures:id="Person1">

 <nc:PersonName>

 <nc:PersonGivenName>Jane</nc:PersonGivenName>

 <nc:PersonSurName>Doe</nc:PersonSurName>

 </nc:PersonName>

</nc:EntityPerson>

</nc:DocumentSubmitter>

 <j:CaseRespondentParty>

 <nc:EntityPerson structures:ref="Person1" xsi:nil="true"/>

Example 2 – backward reference:

 <nc:DocumentSubmitter>

 <nc:EntityPerson structures:ref="Person2" xsi:nil="true"/>

</nc:DocumentSubmitter>

 <j:CaseRespondentParty structures:id="Person2">

 <nc:EntityPerson>

 <nc:PersonName>

 <nc:PersonGivenName>Jane</nc:PersonGivenName>

 <nc:PersonSurName>Doe</nc:PersonSurName>

 </nc:PersonName>

In essence [NIEM NDR] rule 12-6 asserts that the meaning of ‘reference’, established using reference elements, is that ‘reference’ has the meaning “is the same as”.