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Information technology — ASN.1 encoding rules: XML Encoding Rules (XER) —

AMENDMENT 3: PER encoding instructions

Technologies de l'information — Règles de codage ASN.1: Règles de codage XML (XER) —

AMENDEMENT 3: Instructions de codage PER

Reference number
ISO/IEC 8825-4:2002/Amd.3:2008(E)

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INTERNATIONAL STANDARD
ITU-T RECOMMENDATION

Information technology – ASN.1 encoding rules: XML encoding rules

Amendment 3: PER encoding instructions

Conventions used in this amendment: Original, unchanged, text is in normal font. Deleted text is struck-through, thus: ~~deleted text~~. Inserted text is underlined, thus: inserted text.

1) Introduction

In the Introduction, insert "XER" in bullet a) as follows:

Clauses 18 to 39 specify:

a) the syntax of each XER encoding instruction used in a type prefix or an XER encoding control section;

b) restrictions on the XER encoding instructions that can be associated with a particular ASN.1 type (resulting from inheritance and multiple assignments);

c) modifications to the XER encoding rules that are required in an EXTENDED-XER encoding when an XER encoding instruction is applied.

2) Subclause 3.2.3 *bis*

Replace subclause 3.2.3 bis with the following:

3.2.3 *bis* XER encoding instructions: Notation used to change the EXTENDED-XER encoding of a type (or of a component of a type).

NOTE – XER e~~E~~ncoding instructions are included in either~~that are associated with an ASN.1 type (or with a component of an ASN.1 type) by assignment to that type (or component) in~~ an XER type prefix (see ITU-T Rec. X.680 | ISO/IEC 8824-1, 30.3) or an XER encoding control section (see ITU-T Rec. X.680 | ISO/IEC 8824-1, clause 50).

3) Subclause 8.3.3 *bis*

Replace subclause 8.3.3 bis with the following:

8.3.3 *bis* The "XMLBooleanValue" specified in ITU-T Rec. X.680 | ISO/IEC 8824-1, 17.3, shall only be "EmptyElementBoolean" and the "XMLSequenceOfValue" and "XMLSetOfValue" with a component that is a boolean type shall be "XMLValueList".

4) Subclause 8.3.4 *bis*

Replace subclause 8.3.4 bis with the following:

8.3.4 *bis* The "XMLEnumeratedValue" specified in ITU-T Rec. X.680 | ISO/IEC 8824-1, 19.8, shall only be "EmptyElementEnumerated" and the "XMLSequenceOfValue" and "XMLSetOfValue" with a component that is an enumerated type shall be "XMLValueList".

5) Subclauses 10.2.6, 10.2.7 and 10.2.8

In subclauses 10.2.6, 10.2.7 and 10.2.8 change "Encoding Control Section" to "encoding control section".

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6) Subclause 10.2.10

Replace subclause 10.2.10 with the following:

10.2.10 Conforming decoders and validators shall accept, but may ignore, the presence of ~~an~~ type identification attribute ~~from the control namespace~~ in any XML element of an encoding unless its presence and use is as specified in clauses 37 and 38. Encoders shall not generate such attributes except as specified in clauses 37 and 38.

NOTE – Other XML tools may insert such attributes. In general, an EXTENDED-XER decoder cannot easily determine the permitted value and meaning of ~~some~~ type identification attributes ~~from the control namespace~~. Their presence and value may be of use to an application if (for example) unexpected XML child elements are present that are (as a decoder's option) passed to the application – rather than being ignored or producing a fatal decoding error.

7) Subclause 11.4

In subclause 11.4, insert:

"["	(see ITU-T Rec. X.680 | ISO/IEC 8824-1, 11.26)
"]"	(see ITU-T Rec. X.680 | ISO/IEC 8824-1, 11.26)

after

":"	(see ITU-T Rec. X.680 | ISO/IEC 8824-1, 11.26)

8) Subclause 13.5

Replace subclause 13.5 with the following:

13.5 Each use of a "PositiveInstruction" in an XER type prefix or in an XER encoding control section assigns that XER encoding instruction to the corresponding "Type". Each of the alternatives of "PositiveInstruction" (for example, "AnyAttributesInstruction") has two alternatives. Only the first alternative of these shall be used in a type prefix.

9) Subclause 13.7

Replace subclause 13.7 with the following:

13.7 An encoding instruction in a type prefix or in an XER encoding control section can be a positive instruction, used to add or to replace an encoding instruction (use of "PositiveInstruction"), or a negating instruction used to cancel (use of "NegatingInstruction") one or more associated encoding instructions.

10) Clause 14

In the heading for clause 14, insert "XER" before "encoding control section".

11) Subclauses 14.1.2, 14.1.3, 14.1.4 and 14.1.5

Replace subclauses 14.1.2, 14.1.3, 14.1.4 and 14.1.5 with the following:

14.1.2 The XER "EncodingInstructionAssignmentList" production is:

```
EncodingInstructionAssignmentList ::=
        EncodingInstruction
          EncodingInstructionAssignmentList ?
    | "[" EncodingInstruction
        EncodinginstructionAssignmentList ?
```

14.1.3 The "EncodingInstruction" production is defined in 13.3. Each alternative of "PositiveInstruction" (for example "AnyAttributesInstruction") has two alternatives. An XER encoding control section shall contain only one of the alternatives for "EncodingInstructionAssignmentList". If the first alternative is used, then the first alternative for each of the alternatives of "PositiveInstruction" shall be used. If the second alternative is used, then the second alternative for each of the alternatives of "PositiveInstruction" shall be used.

NOTE – Each alternative of "PositiveInstruction" provides two alternative forms. The first is provided for historical reasons. The second alternative form provides the matching "]" and moves the "TargetList" (if any) to the end of the production. It is provided for similarity with the syntax used in the "EncodingInstructionAssignmentList" of other ASN.1 encoding rule standards, and for

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readability. The use of the second alternative of the "EncodingInstructionAssignmentList" (and hence the second alternative of all the alternatives of "PositiveInstruction" within it) is recommended for new specifications.

14.1.4 Each use of an "EncodingInstruction" in an XER encoding control section assigns that XER encoding instruction to the occurrences of "Type" that are identified in the "TargetList" of the encoding instruction, or to the type references in an imports list. The "TargetList" production and the targets it identifies are specified in 14.2.

14.1.5 Subclauses 13.4 to 13.14 also apply to encoding instructions in an XER encoding control section. The clauses defining the detailed syntax for each encoding instruction category are listed in Table 1. Categories of XER encoding instructions are also listed in Table 1.

12) Subclause 14.2.1.2

In subclause 14.2.1.2, NOTE 2, insert "XER" before "encoding control section".

13) Subclause 14.2.1.17

In subclause 14.2.1.17, insert "XER" before "encoding control section".

14) Subclause 14.2.3.1

Replace subclause 14.2.3.1 with the following:

14.2.3.1 The "BuiltInTypeIdentification" production is:

```
BuiltInTypeIdentification ::=
    BuiltInTypeName
    BuiltInTypeQualifyingInformationPart ?

BuiltInTypeName::=
    BIT STRING
    | BOOLEAN
    | CHARACTER STRING
    | CHOICE
    | DATE
    | DATE-TIME
    | DURATION
    | EMBEDDED PDV
    | ENUMERATED
    | EXTERNAL
    | GeneralizedTime
    | INSTANCE OF
    | INTEGER
    | NULL
    | ObjectDescriptor
    | OBJECT IDENTIFIER
    | OCTET STRING
    | REAL
    | RELATIVE-OID
    | SEQUENCE
    | SEQUENCE OF
    | SET
    | SET OF
    | TIME
    | TIME-OF-DAY
    | UTCTime
    | RestrictedCharacterStringType

BuiltInTypeQualifyingInformationPart ::=
    ":"
    BuiltInTypeQualifyingInformation
```


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BuiltInTypeQualifyingInformation
identifier
| **ALL**

15) Subclause 15.1.3

In subclause 15.1.3 and its NOTE, insert "XER" before all 4 occurrences of "encoding control section".

16) Subclause 15.4.3

In subclause 15.4.3, insert "XER" before both occurrences of "encoding control section" in the NOTE.

17) Subclause 16.4

In subclause 16.4, insert "XER" before "encoding control section" in the NOTE.

18) Subclause 18.1.1

Replace subclause 18.1.1 with the following:

18.1.1 The "AnyAttributesInstruction" is:

AnyAttributesInstruction ::=
ANY-ATTRIBUTES TargetList NamespaceRestriction ?
| ANY-ATTRIBUTES NamespaceRestriction ? "]" TargetList

NamespaceRestriction ::=
FROM URIList
| EXCEPT URIList

URIList ::=
QuotedURIorAbsent
| URIList QuotedURIorAbsent

QuotedURIorAbsent ::=
QuotedURI
| ABSENT

19) Subclause 18.2.12

In subclause 18.2.12, insert "XER" before "encoding control section".

20) Subclause 19.1.1

Replace subclause 19.1.1 with the following:

19.1.1 The "AnyElementInstruction" is:

AnyElementInstruction ::=
ANY-ELEMENT TargetList NamespaceRestriction ?
| ANY-ELEMENT NamespaceRestriction ? "]" TargetList

21) Subclause 19.1.4

Replace subclause 19.1.4 with the following:

19.1.4 This encoding instruction enables an ASN.1 type that is an octetstring or a **UTF8String** to provide the specification of a single XML element.

NOTE – The content and attributes of the XML element are unrestricted. It may have attributes or child elements, and names of child elements and attributes may be qualified or unqualified, and are not affected by any "NamespaceRestriction".

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22) Subclause 19.1.6

Replace subclause 19.1.6 with the following:

19.1.6 The type ~~**UTF8String**~~ with this final encoding instruction may be the root type of the encoding, or may be a component of a choice, sequence, set, sequence-of or set-of type. If it is a top-level type, the type reference name is ignored. If it is a component, the ~~identifier~~ component name is ignored.

23) Subclause 19.2.1

Replace subclause 19.2.1 with the following:

19.2.1 An ASN.1 type shall not have this final encoding instruction unless it is an octetstring type or a **UTF8String** type restricted as follows:~~.~~

a) if the type is an octetstring type, it is required to have a restriction applied to it so that each abstract value is a fast infoset document in conformance with ITU-T Rec. X.891 | ISO/IEC 24824-1.

NOTE 1 – It is recommended that the constraint on the octetstring be expressed as:

```
(CONSTRAINED BY
  {/* Shall be a fast infoset document in conformance with
     ITU-T Rec. X.891 | ISO/IEC 24824-1. */})
```

b) if the type is a **UTF8String**, it ~~The component~~ is required to have a restriction applied to it that imposes the format and content specified in 19.2.4 to 19.2.9 by reference to this clause 19 or otherwise.

NOTE 2 – It is recommended that the constraint on the **UTF8String** be expressed as:

```
(CONSTRAINED BY
  {/* Shall conform to the "AnyElementFormat" specified in
       ITU-T Rec. X.693 | ISO/IEC 8825-4, clause 19. */})
```

24) Subclauses 19.2.7-19.2.9

Replace subclauses 19.2.7-19.2.9 with the following:

19.2.7 The value of the octetstring or of the **UTF8String** shall not cause 10.2.11 to be violated.

19.2.8 If there is a "NamespaceRestriction" of **FROM**, then the root element of the fast infoset document (case (a) of 19.2.1) or the (outermost) element name in "AnyElementFormat" (case (b) of 19.2.1) shall be the "URI" in a "QuotedURI" in the "URIList", and may be absent only if the keyword **ABSENT** occurs in the "URIList".

19.2.9 If there is a "NamespaceRestriction" of **EXCEPT**, then the root element of the fast infoset document (case (a) of 19.2.1) or the (outermost) element name in "AnyElementFormat" shall not be the "URI" in a "QuotedURI" in the "URIList", and shall not be absent if the keyword **ABSENT** occurs in the "URIList".

25) Subclause 19.2.10

In subclause 19.2.10, insert "XER" before "encoding control section".

26) Subclauses 19.3.1-19.3.4

Replace subclauses 19.3.1-19.3.4 with the following:

19.3.1 When this encoding instruction is applied to an octetstring, an EXTENDED-XER encoder shall convert the fast infoset document in the octetstring to an XML document, and shall include the root element of that XML document in the encoding in place of an XML element that would otherwise be generated for this component (ignoring the identifier of the component), or for the root type.

19.3.1 *bis* When this encoding instruction is applied to a **UTF8String**, ~~A~~an EXTENDED-XER encoder shall include the abstract value of the **UTF8String** in the encoding as an XML element in place of an XML element that would otherwise be generated for this component (ignoring the identifier of the component), or for the root type. The element included shall be identical to the abstract value of the **UTF8String**~~.~~, except as specified in 19.3.2.

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19.3.2 Any namespace declarations that are present in the ~~first start-tag (or empty-element tag) of the~~ element and are identical to namespace declarations that are in-scope at the point of insertion may (but need not) be removed, as an encoder's option.

NOTE – Changing, moving, or deleting other namespace declarations in the **UTF8String** has not been allowed, as such actions may affect the namespace and qualification of XML QNames present in element content or attribute values, and it is generally not possible for an encoder to determine whether such content or attribute values are QNames or not.

19.3.2 *bis* When this encoding instruction is applied to an octetstring, an EXTENDED-XER decoder shall convert the next XML element in the encoding to an XML document that has that element as its root element, and shall convert that XML document to a fast infoset document.

19.3.3 When this encoding instruction is applied to a **UTF8String**, ~~A~~an EXTENDED-XER decoder shall generate the format of 19.2.4 from the ~~incoming XML document~~ next XML element in the encoding, as the abstract value of the **UTF8String**.

19.3.4 The decoder shall include, in the root element of the fast infoset document or in the topmost element in the **UTF8String** ~~first start-tag (or empty-element tag) in the abstract value of the **UTF8String**,~~ namespace declaration attributes for all namespace declarations that are in scope for the element being decoded but that are not present in ~~the start-tag of~~ that element.

27) Subclause 20.1.1

Replace subclause 20.1.1 with the following:

20.1.1 The "AttributeInstruction" is:

AttributeInstruction ::=
ATTRIBUTE TargetList
| ATTRIBUTE "]" TargetList

28) Subclause 21.1.1

Replace subclause 21.1.1 with the following:

21.1.1 The "Base64Instruction" is:

Base64Instruction ::=
BASE64 TargetList
| BASE64 "]" TargetList

29) Subclause 22.1.1

Replace subclause 22.1.1 with the following:

22.1.1 The "DecimalInstruction" is:

DecimalInstruction ::=
DECIMAL TargetList
| DECIMAL "]" TargetList

30) Subclause 22.2.3

In subclause 22.2.3, insert "XER" before "encoding control section".

31) Subclause 23.1.1

Replace subclause 23.1.1 with the following:

23.1.1 The "DefaultForEmptyInstruction" is:

DefaultForEmptyInstruction::=
DEFAULT-FOR-EMPTY TargetList AS Value
| DEFAULT-FOR-EMPTY AS Value "]" TargetList

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32) Subclause 23.2.7

In subclause 23.2.7, insert "XER" before "encoding control section".

33) Subclause 24.1.1

Replace subclause 24.1.1 with the following:

24.1.1 The "ElementInstruction" is:

ElementInstruction ::=
ELEMENT TargetList
| ELEMENT "]" TargetList

34) Subclause 25.1.1

Replace subclause 25.1.1 with the following:

25.1.1 The "EmbedValuesInstruction" is:

EmbedValuesInstruction ::=
EMBED-VALUES TargetList
| EMBED-VALUES "]" TargetList

35) Subclause 25.2.1

Replace subclause 25.2.1 with the following:

25.2.1 An ASN.1 type shall not have this final encoding instruction unless it is a sequence type. The first component of the sequence shall not be marked **OPTIONAL** or **DEFAULT**, and shall be a sequence-of type whose component is a **UTF8String** with a constraint that forbids control characters.~~**SEQUENCE OF UTF8String** and shall not be marked **OPTIONAL** or **DEFAULT**.~~

36) Subclause 25.2.7

In subclause 25.2.7, insert "XER" before "encoding control section".

37) Subclause 26.1.1

Replace subclause 26.1.1 with the following:

26.1.1 The "GlobalDefaultsInstruction" is:

GlobalDefaultsInstruction ::=
GLOBAL-DEFAULTS TargetList DefaultSetting
| GLOBAL-DEFAULTS DefaultSetting "]" TargetList

DefaultSetting ::=
ControlNamespace
| MODIFIED-ENCODINGS

ControlNamespace ::=
CONTROL-NAMESPACE
QuotedURI
Prefix ?

38) Subclauses 26.2.1 and 26.2.2

In subclauses 26.2.1 and 26.2.2, insert "XER" before "encoding control section".

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39) Subclause 27.1.1

Replace subclause 27.1.1 with the following:

27.1.1 The "ListInstruction" is:

ListInstruction ::=
LIST TargetList
| LIST "]" TargetList

40) Subclause 28.1.1

Replace subclause 28.1.1 with the following:

28.1.1 The "NameInstruction" is:

NameInstruction ::=
NAME TargetList AS NewNameOrKeyword
| NAME AS NewNameOrKeyword "]" TargetList

NewNameOrKeyword ::=
NewName
| Keyword

NewName ::=
RestrictedCharacterStringValue

Keyword ::=
CAPITALIZED
| UNCAPITALIZED
| UPPERCASED
| LOWERCASED

41) Subclause 29.1.1

Replace subclause 29.1.1 with the following:

29.1.1 The "NamespaceInstruction" is:

NamespaceInstruction ::=
NAMESPACE TargetList NamespaceSpecification ?
| NAMESPACE NamespaceSpecification ? "]" TargetList

NamespaceSpecification ::=
AS
QuotedURI
Prefix ?

Prefix ::=
PREFIX
QuotedNCName

QuotedURI ::=
""" & URI & """

QuotedNCName ::=
""" & NCName & """

42) Subclause 29.2.1

In subclause 29.2.1, insert "XER" before "encoding control section".

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43) Subclause 29.2.2

Add a new subclause 29.2.2 as follows:

29.2.2 An ASN.1 type shall not have both a final **ATTRIBUTE** encoding instruction and a final **NAMESPACE** encoding instruction specifying the control namespace.

44) Subclause 30.1.1

Replace subclause 30.1.1 with the following:

30.1.1 The "PIOrCommentInstruction" is:

PiOrCommentInstruction ::=
PI-OR-COMMENT TargetList AS RestrictedCharacterStringValue Position
| PI-OR-COMMENT AS RestrictedCharacterStringValue Position "]" TargetList

Position ::=
BEFORE-TAG
| BEFORE-VALUE
| AFTER-VALUE
| AFTER-TAG

45) Subclause 31.1.1

Replace subclause 31.1.1 with the following:

31.1.1 The "TextInstruction" is:

TextInstruction ::=
TEXT TargetList TextToBeUsed ?
| TEXT TextToBeUsed ? "]" TargetList

TextToBeUsed ::=
AS NewNameOrKeyword

46) Subclause 31.1.4

Replace subclause 31.1.4 with the following:

31.1.4 The "NewNameOrKeyword" is defined in clause 28. ~~The "NewName" in "NewNameOrKeyword" shall contain at least one character.~~

47) Subclause 31.2.3 *bis*

Add a new subclause 31.2.3 bis as follows:

31.2.3 *bis* The "RestrictedCharacterStringValue" in "NewName" when used in the **TEXT** encoding instruction shall not contain any control characters.

48) Subclause 31.2.5

Replace subclause 31.2.5 with the following:

31.2.5 If the **TEXT** encoding instruction is applied to a bitstring type with named bits and "NewName" is used, the "NewName" shall contain at least one character, shall not contain "white-space with escapes" (see 8.1.5), and shall not commence with a "0" (DIGIT ZERO) or a "1" (DIGIT ONE).

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49) Subclause 32.1.1

Replace subclause 32.1.1 with the following:

32.1.1 The "UntaggedInstruction" is:

UntaggedInstruction ::=
`UNTAGGED` TargetList
| `UNTAGGED "]"` TargetList

50) Subclause 32.2.1

Replace subclause 32.2.1 with the following:

32.2.1 In all instances of use, the enclosing type shall be a sequence, set, choice, sequence-of, or set-of type. When the enclosing type is a sequence, set, or choice type, it shall not contain an extension marker.

51) Subclause 32.2.5

In subclause 32.2.5, insert "XER" before "encoding control section".

52) Subclause 32.3.4

In subclause 32.3.4, insert "XER" before "encoding control section" in NOTE 1.

53) Subclause 33.1.1

Replace subclause 33.1.1 with the following:

33.1.1 The "UseNilInstruction" is:

UseNilInstruction ::=
`USE-NIL` TargetList
| `USE-NIL "]"` TargetList

54) Subclause 33.2.6

In subclause 33.2.6, insert "XER" before "encoding control section".

55) Subclause 34.1.1

Replace subclause 34.1.1 with the following:

34.1.1 The "UseNumberInstruction" is:

UseNumberInstruction ::=
`USE-NUMBER` TargetList
| `USE-NUMBER "]"` TargetList

56) Subclause 34.3.4

In subclause 34.3.4, change both occurrences of "Encoding Control Section" to "encoding control section" in the NOTE.

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57) Subclause 35.1.1

Replace subclause 35.1.1 with the following:

35.1.1 The "UseOrderInstruction" is:

UseOrderInstruction ::=
USE-ORDER TargetList
| USE-ORDER "]" TargetList

58) Subclause 35.2.1

Replace subclause 35.2.1 with the following:

35.2.1 This encoding instruction shall only be assigned to a sequence type that does not contain an extension marker. The sequence type shall contain a component that is a sequence-of type (type A, say) with a component that is an enumerated type. If the sequence type does not have also a final **EMBED-VALUES** encoding instruction, then type A shall be the first component; otherwise, it shall be the second component. If there is no final **USE-NIL** encoding instruction, the sequence type shall also have at least one other component with no final **ATTRIBUTE** or **ANY-ATTRIBUTES** encoding instruction (a non-attribute component). If there is a final **USE-NIL** encoding instruction, the **OPTIONAL** component supporting the **USE-NIL** shall be a sequence type, and it shall have at least one component.

59) Subclauses 35.2.2.1 and 35.2.2.2

Replace subclauses 35.2.2.1 and 35.2.2.2 with the following:

35.2.2.1 If there is no final **USE-NIL** encoding instruction, then the enumerated type shall have identifiers for the enumerations that are in one-to-one correspondence (and are in the same textual order) with the identifiers of the following non-attribute components (see 35.2.1) of the sequence. The sequence ~~of~~ type shall be constrained so that every abstract value of the sequence-of component contains exactly one identifier for each non-attribute component of the sequence that is present in the abstract value.

35.2.2.2 If there is a final **USE-NIL** encoding instruction, then the enumerated type shall have identifiers for the enumerations that are in one-to-one correspondence (and are in the same textual order) with the identifiers of the components of the **OPTIONAL** component in the sequence type. The sequence ~~of~~ type shall be constrained so that every abstract value of the sequence-of component contains exactly one identifier for each component of the **OPTIONAL** sequence that is present in the abstract value.

NOTE – It is recommended that the constraint on the sequence type be expressed as:

```
(CONSTRAINED BY {/* Shall conform to ITU-T Rec. X.693 | ISO/IEC 8825-4, clause 35 */})
```

60) Subclause 35.2.5

Replace subclause 35.2.5 with the following:

35.2.5 No component of either the sequence with this final encoding instruction or the **OPTIONAL** sequence (when a final **USE-NIL** encoding instruction is present) shall have a final **UNTAGGED** encoding instruction, whether the type of that component is a character-encodable type or not, unless the type of that component is a choice type and none of its alternatives has a final **UNTAGGED** encoding instruction.

61) Subclause 35.2.7

In subclause 35.2.7, insert "XER" before "encoding control section".

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62) Subclause 36.1.1

Replace subclause 36.1.1 with the following:

36.1.1 The "UseQNameInstruction" is:

UseQNameInstruction ::=
`USE-QNAME` TargetList
| `USE-QNAME "]"` TargetList

63) Subclause 36.2.3

In subclause 36.2.3, insert "XER" before "encoding control section".

64) Subclause 37.1.1

Replace subclause 37.1.1 with the following:

37.1.1 The "UseTypeInstruction" is:

UseTypeInstruction ::=
`USE-TYPE` TargetList
| `USE-TYPE "]"` TargetList

65) Subclause 37.2.4

In subclause 37.2.4, insert "XER" before "encoding control section".

66) Subclause 38.1.1

Replace subclause 38.1.1 with the following:

38.1.1 The "UseUnionInstruction" is:

UseUnionInstruction ::=
`USE-UNION` TargetList
| `USE-UNION "]"` TargetList

67) Subclause 38.2.7

In subclause 38.2.7, insert "XER" before "encoding control section".

68) Subclause 39.1.1

Replace subclause 39.1.1 with the following:

39.1.1 The "WhiteSpaceInstruction" is:

WhiteSpaceInstruction ::=
`WHITESPACE` TargetList WhiteSpaceAction
| `WHITESPACE` WhiteSpaceAction "]" TargetList

WhiteSpaceAction ::=
`REPLACE`
| `COLLAPSE`

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69) Subclause 39.2.1

Replace subclause 39.2.1 with the following:

39.2.1 This encoding instruction can only be assigned to:

a) a restricted character string type that either does not contain, or is constrained not to contain the following characters:

1a) HORIZONTAL TABULATION (9);

2b) LINE FEED (10);

3c) CARRIAGE RETURN (13);

b) a type with a final **TEXT** encoding instruction whose "NewName" does not contain these characters.

70) Subclause 39.2.2 *bis*

Add a new subclause 39.2.2 bis as follows:

39.2.2 *bis* If this encoding instruction has the **COLLAPSE** option, then it shall not be applied to a type with a final **TEXT** encoding instruction whose "NewName" has leading or trailing spaces or contains multiple adjacent spaces.

71) Subclauses 39.3.1 and 39.3.2

Replace subclauses 39.3.1 and 39.3.2 with the following:

39.3.1 If the keyword **REPLACE** is used, every SPACE (32) present in the abstract value of the character string (case (a) of 39.2.1) or in the "NewName" of the **TEXT** encoding instruction (case (b) of 39.2.1) can be replaced, as an encoder's option, by a single character that is "white-space with escapes" (see 8.1.5).

39.3.2 If the keyword **COLLAPSE** is used, every SPACE (32) present in the abstract value of the character string (case (a) of 39.2.1) or in the "NewName" of the **TEXT** encoding instruction (case (b) of 39.2.1) can be replaced, as an encoder's option, by any number of "white-space with escapes" characters. In addition, one or more such characters can be added to the beginning and/or to the end of the "ExtendedXMLValue" encoding as an encoder's option.

72) Subclauses C.1.6 and C.1.7

In subclauses C.1.6 and C.1.7, change "Encoding Control Section" to "XER encoding control section".

73) Subclause C.2.2

In subclause C.2.2, change "Encoding Control Section" to "encoding control section".

Append the following text to the end of the subclause:

The XER encoding control section could alternatively be (recommended):

```
ENCODING-CONTROL XER
        [NAME AS UNCAPITALIZED] Employee
        [ATTRIBUTE]             Employee.id
        [LIST]                  Employee.salaries
```


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