T<small>HE</small> DDLM D<small>ICTIONARY AS A</small> STAR F<small>ILE</small>

```
#############################################################################
#                                                                           #
#                       DDLm REFERENCE DICTIONARY                           #
#                                                                           #
#############################################################################

data_DDL_DIC

    _dictionary.title           DDL_DIC
    _dictionary.class           Reference
    _dictionary.version         3.10.01
    _dictionary.date            2012-05-07
    _dictionary.uri             www.iucr.org/cif/dic/ddl.dic
    _dictionary.ddl_conformance 3.10.01
    _dictionary.namespace       DdlDic
    _description.text
;
     This dictionary contains the definitions of attributes that
     make up the DDLm dictionary definition language.  It provides
     the meta meta data for all CIF dictionaries.
;

save_ATTRIBUTES
    _definition.id              ATTRIBUTES
    _definition.scope           Category
    _definition.class           Head
    _definition.update          2011-07-27
    _description.text
;
     This category is parent of all other categories in the DDLm
     dictionary.
;
    _name.object_id             ATTRIBUTES


    #=====================================================================

save_ALIAS

    _definition.id              ALIAS
    _definition.scope           Category
    _definition.class           Loop
    _definition.update          2011-06-07
    _description.text
;
     The attributes used to specify the aliased names of definitions.
;
    _name.category_id           ATTRIBUTES
    _name.object_id             ALIAS
    _category.key_id            '_alias.definition_id'


save_alias.definition_id
    _definition.id              '_alias.definition_id'
    _definition.class           Attribute
    _definition.update          2006-11-16
    _description.text
;
     Identifier tag of an aliased definition.
;
    _name.category_id           alias
    _name.object_id             definition_id
    _type.purpose               Key
    _type.container             Single
    _type.contents              Tag
     save_
```

```
save_alias.dictionary_uri
    _definition.id              '_alias.dictionary_uri'
    _definition.update          2006-11-16
    _definition.class           Attribute
    _description.text
;
    Dictionary URI in which the aliased definition belongs.
;
    _name.category_id           alias
    _name.object_id             dictionary_uri
    _type.purpose               Identify
    _type.container             Single
    _type.contents              Uri
     save_

     save_   #------ close of ALIAS category


#=============================================================================


save_CATEGORY

    _definition.id              CATEGORY
    _definition.scope           Category
    _definition.class           Set
    _definition.update          2006-11-16
    _description.text
;
    The attributes used to specify the properties of a
    "category" of data items.
;
    _name.category_id           ATTRIBUTES
    _name.object_id             CATEGORY


save_category.key_id
    _definition.id              '_category.key_id'
    _definition.update          2011-07-27
    _definition.class           Attribute
    _description.text
;
    Tag of a data item in a Loop category which is the generic key
    to access other items in the category. The value of this
    item must be unique in order to provide unambiguous access to
    a packet (row) in the table of values.
;
    _name.category_id           category
    _name.object_id             key_id
    _type.purpose               Identify
    _type.container             Single
    _type.contents              Tag
     save_

     save_   #------ close of CATEGORY category


#=============================================================================


save_DEFINITION

    _definition.id              DEFINITION
    _definition.scope           Category
    _definition.class           Set
    _definition.update          2011-06-20
    _description.text
;
    The attributes for classifying dictionary definitions.
;
    _name.category_id           ATTRIBUTES
    _name.object_id             DEFINITION
```

```
save_definition.class
    _definition.id              '_definition.class'
    _definition.update          2012-05-07
    _definition.class           Attribute
    _description.text
;
      The nature and the function of a definition or definitions.
;
    _name.category_id           definition
    _name.object_id             class
    _type.purpose               State
    _type.container             Single
    _type.contents              Code
     loop_
    _enumeration_set.state
    _enumeration_set.detail

      Attribute
;                  Item used as an attribute in the definition
                   of other data items. Applied in dictionaries only.
;
      Datum
;                  Item defined in a domain-specific dictionary.
                   These items appear only in data instance files.
;
      Head
;                  Category of items that is the parent of
                   all other categories in the dictionary.
;
      Loop
;                  Category of items that in a data file must
                   reside in a loop-list with a key item defined.
;
      Set
;                  Category of items that form a set (but not a
                   loopable list). These items may be referenced
                   as a class of items in a dREL methods expression.
;
      Ref-loop
;                  A category containing one item that identifies the
                   a category of items that is repeated in a sequence
                   of save frames. The item, which is specifies as a
                   as a Ref-table value (see type.container), is looped.
                   This construction is for loop categories that contain
                   child categories.
                   If in the instance file, the child items have only
                   one set of values, the Ref-loop item need not be used
                   and child items need not be placed in a save frame.
;
    _enumeration.default        Datum
     save_


save_definition.id
    _definition.id              '_definition.id'
    _definition.update          2006-11-16
    _definition.class           Attribute
    _description.text
;
      Identifier name of the definition contained within a save frame.
;
    _name.category_id           definition
    _name.object_id             id
    _type.purpose               Identify
    _type.container             Single
    _type.contents              Tag
     save_


save_definition.scope
    _definition.id              '_definition.scope'
    _definition.update          2006-11-16
    _definition.class           Attribute
    _description.text
```

```
;
      The extent to which a definition affects other definitions.
;
     _name.category_id          definition
     _name.object_id            scope
     _type.purpose              State
     _type.container            Single
     _type.contents             Code
      loop_
     _enumeration_set.state
     _enumeration_set.detail
          Dictionary        "applies to all defined items in the dictionary"
          Category          "applies to all defined items in the category"
          Item              "applies to a single item definition"
     _enumeration.default      Item
      save_


save_definition.update
     _definition.id             '_definition.update'
     _definition.update         2006-11-16
     _definition.class          Attribute
     _description.text
;
      The date that a definition was last changed.
;
     _name.category_id          definition
     _name.object_id            update
     _type.purpose              Audit
     _type.container            Single
     _type.contents             Date
      save_


save_definition.xref_code
     _definition.id             '_definition.xref_code'
     _definition.update         2006-11-16
     _definition.class          Attribute
     _description.text
;
      Code identifying the equivalent definition in the dictionary
      referenced by the DICTIONARY_XREF attributes.
;
     _name.category_id          definition
     _name.object_id            xref_code
     _type.purpose              Audit
     _type.container            Single
     _type.contents             Code
      save_

      save_    #------ close the DEFINITION category

#--------------------------------------------------------------------------


save_DESCRIPTION

     _definition.id             DESCRIPTION
     _definition.scope          Category
     _definition.class          Set
     _definition.update         2011-06-20
     _description.text
;
      The attributes of descriptive (non-machine parseable) parts of
      definitions.
;
     _name.category_id          ATTRIBUTES
     _name.object_id            DESCRIPTION


save_description.key_words
     _definition.id             '_description.key_words'
     _definition.update         2008-05-18
     _definition.class          Attribute
```

```
        _description.text
    ;
          List of key-words categorising the item.
    ;
        _description.common          'key words'
        _name.category_id            description
        _name.object_id              key_words
        _type.purpose                Describe
        _type.container              List
        _type.contents               Text
          save_


save_description.common
        _definition.id               '_description.common'
        _definition.update           2006-11-16
        _definition.class            Attribute
        _description.text
    ;
          Commonly-used identifying name for the item.
    ;
        _description.common          'common name'
        _name.category_id            description
        _name.object_id              common
        _type.purpose                Describe
        _type.container              Single
        _type.contents               Text
          save_


save_description.text
        _definition.id               '_description.text'
        _definition.update           2006-11-16
        _definition.class            Attribute
        _description.text
    ;
          The text description of the defined item.
    ;
        _description.common          'description'
        _name.category_id            description
        _name.object_id              text
        _type.purpose                Describe
        _type.container              Single
        _type.contents               Text
          save_


    #------------------------------------------------------------------------


save_DESCRIPTION_EXAMPLE

        _definition.id               DESCRIPTION_EXAMPLE
        _definition.scope            Category
        _definition.class            Loop
        _definition.update           2011-06-20
        _description.text
    ;
          The attributes of descriptive (non-machine parseable) examples of
          values of the defined items.
    ;
        _name.category_id            DESCRIPTION
        _name.object_id              EXAMPLE
        _category.key_id             '_description_example.case'


save_description_example.case
        _definition.id               '_description_example.case'
        _definition.update           2006-11-16
        _definition.class            Attribute
        _description.text
    ;
          An example case of the defined item.
    ;
```

```
    _name.category_id          example
    _name.object_id            case
    _type.purpose              Key
    _type.container            Single
    _type.contents             Text
     save_


save_description_example.detail
    _definition.id             '_description_example.detail'
    _definition.update         2006-11-16
    _definition.class          Attribute
    _description.text
;
     A description of an example case for the defined item.
;
    _name.category_id          example
    _name.object_id            detail
    _type.purpose              Describe
    _type.container            Single
    _type.contents             Text
     save_

     save_   #----- close the DESCRIPTION_EXAMPLE category

     save_   #----- close the DESCRIPTION category

#-----------------------------------------------------------------------


save_DICTIONARY

    _definition.id             DICTIONARY
    _definition.scope          Category
    _definition.class          Set
    _definition.update         2011-06-20
    _description.text
;
     Attributes for identifying and registering the dictionary. The items
     in this category are NOT used as attributes of INDIVIDUAL data items.
;
    _name.category_id          ATTRIBUTES
    _name.object_id            DICTIONARY


save_dictionary.class
    _definition.id             '_dictionary.class'
    _definition.update         2012-05-07
    _definition.class          Attribute
    _description.text
;
     The nature, or field of interest, of data items defined in the dictionary.
;
    _name.category_id          dictionary
    _name.object_id            class
    _type.purpose              State
    _type.container            Single
    _type.contents             Code
     loop_
    _enumeration_set.state
    _enumeration_set.detail
            Reference      'DDLm reference attribute definitions'
            Instance       'domain-specific data instance definitions'
            Template       'domain-specific attribute/enumeration templates'
            Function       'domain-specific method function templates'
    _enumeration.default       Instance
     save_


save_dictionary.date
    _definition.id             '_dictionary.date'
    _definition.update         2006-11-16
    _definition.class          Attribute
    _description.text
```

```
;
      The date that the last dictionary revision took place.
;
      _name.category_id             dictionary
      _name.object_id               date
      _type.purpose                 Audit
      _type.container               Single
      _type.contents                Date
       save_


save_dictionary.ddl_conformance
      _definition.id                '_dictionary.ddl_conformance'
      _definition.update            2006-11-16
      _definition.class             Attribute
      _description.text
;
      The version number of the DDL dictionary that this dictionary
      conforms to.
;
      _name.category_id             dictionary
      _name.object_id               ddl_conformance
      _type.purpose                 Audit
      _type.container               Single
      _type.contents                Version
       save_


save_dictionary.namespace
      _definition.id                '_dictionary.namespace'
      _definition.update            2006-12-05
      _definition.class             Attribute
      _description.text
;
      The namespace code that may be prefixed (with a trailing colon
      ":") to an item tag defined in the defining dictionary when used
      in particular applications. Because tags must be unique, namespace
      codes are unlikely to be used in data files.
;
      _name.category_id             dictionary
      _name.object_id               namespace
      _type.purpose                 Audit
      _type.container               Single
      _type.contents                Code
       save_


save_dictionary.title
      _definition.id                '_dictionary.title'
      _definition.update            2006-11-16
      _definition.class             Attribute
      _description.text
;
      The common title of the dictionary. Will usually match the name
      attached to the data_ statement of the dictionary file.
;
      _name.category_id             dictionary
      _name.object_id               title
      _type.purpose                 Audit
      _type.container               Single
      _type.contents                Code
       save_


save_dictionary.uri
      _definition.id                '_dictionary.uri'
      _definition.update            2006-11-16
      _definition.class             Attribute
      _description.text
;
      The universal resource indicator of this dictionary.
;
      _name.category_id             dictionary
      _name.object_id               uri
```

```
    _type.purpose               Identify
    _type.container             Single
    _type.contents              Uri
     save_


save_dictionary.version
    _definition.id              '_dictionary.version'
    _definition.update          2006-11-16
    _definition.class           Attribute
    _description.text
;
    A unique version identifier for the dictionary.
;
    _name.category_id           dictionary
    _name.object_id             version
    _type.purpose               Audit
    _type.container             Single
    _type.contents              Version
     save_



#-------------------------------------------------------------------------


save_DICTIONARY_AUDIT

    _definition.id              DICTIONARY_AUDIT
    _definition.scope           Category
    _definition.class           Loop
    _definition.update          2011-06-20
    _description.text
;
    Attributes for identifying and registering the dictionary. The items
    in this category are NOT used as attributes of individual data items.
;
    _name.category_id           DICTIONARY
    _name.object_id             AUDIT
    _category.key_id            '_dictionary_audit.version'


save_dictionary_audit.date
    _definition.id              '_dictionary_audit.date'
    _definition.update          2011-06-27
    _definition.class           Attribute
    _description.text
;
    The date of each dictionary revision.
;
    _name.category_id           audit
    _name.object_id             date
    _type.purpose               Audit
    _type.container             Single
    _type.contents              Date
     save_


save_dictionary_audit.revision
    _definition.id              '_dictionary_audit.revision'
    _definition.update          2011-06-27
    _definition.class           Attribute
    _description.text
;
    A description of the revision applied for the _dictionary_audit.version.
;
    _name.category_id           audit
    _name.object_id             revision
    _type.purpose               Describe
    _type.container             Single
    _type.contents              Text
     save_


save_dictionary_audit.version
```

```
        _definition.id              '_dictionary_audit.version'
        _definition.update          2011-06-27
        _definition.class           Attribute
        _description.text
;
      A unique version identifier for each revision of the dictionary.
;
        _name.category_id           audit
        _name.object_id             version
        _type.purpose               Key
        _type.container             Single
        _type.contents              Version
         save_

         save_     #------- close the DICTIONARY_AUDIT category


    #----------------------------------------------------------------------------


    save_DICTIONARY_VALID

        _definition.id              DICTIONARY_VALID
        _definition.scope           Category
        _definition.class           Loop
        _definition.update          2011-06-21
        _description.text
;
      Data items which are used to specify the contents of definitions in
      the dictionary in terms of the _definition.scope    and the required
      and prohibited attributes.
;
        _name.category_id           DICTIONARY
        _name.object_id             VALID
        _category.key_id            '_dictionary_valid.application'


    save_dictionary_valid.attributes
        _definition.id              '_dictionary_valid.attributes'
        _definition.update          2011-06-27
        _definition.class           Attribute
        _description.text
;
      A list of the attribute names and categories that are assessed
      for application in the item, category and dictionary definitions.
;
        _name.category_id           valid
        _name.object_id             attributes
        _type.purpose               Audit
        _type.container             List
        _type.contents              Text
         save_


    save_dictionary_valid.option
        _definition.id              '_dictionary_valid.option'
        _definition.update          2011-06-27
        _definition.class           Attribute
        _description.text
;
      Option codes for applicability of attributes in definitions.
;
        _name.category_id           valid
        _name.object_id             option
        _type.purpose               Audit
        _type.container             Single
        _type.contents              Code
         loop_
        _enumeration_set.state
        _enumeration_set.detail
                Mandatory      'attribute must be present in definition frame'
                Recommended    'attribute is usually in definition frame'
                Prohibited     'attribute must not be used in definition frame'
         save_
```

```
save_dictionary_valid.application
    _definition.id               '_dictionary_valid.application'
    _definition.update           2011-06-27
    _definition.class            Attribute
    _description.text
;
    Provides the information identifying the definition scope (
    from the _definition.scope enumeration list) and the validity
    options (from the _dictionary_valid.option enumeration list),
    as a two element list. This list signals the validity of applying
    the attributes given in _dictionary_valid.attributes.
;
    _name.category_id            valid
    _name.object_id              application
    _type.purpose                Key
    _type.container              List
    _type.contents               Code
    _type.dimension              [2]
    _method.purpose
    _method.expression
     Definition
;
    _dictionary_valid.application
                    = [_definition.scope,_dictionary_valid.option]
;
    save_

    save_    #------- close the DICTIONARY_VALID category

#-------------------------------------------------------------------------


save_DICTIONARY_XREF

    _definition.id               DICTIONARY_XREF
    _definition.scope            Category
    _definition.class            Loop
    _definition.update           2011-06-20
    _description.text
;
    Data items which are used to cross reference other dictionaries that
    have defined the same data items. Data items in this category are NOT
   o used as attributes of individual data items.
;
    _name.category_id            DICTIONARY
    _name.object_id              XREF
    _category.key_id             '_dictionary_xref.code'


save_dictionary_xref.code
    _definition.id               '_dictionary_xref.code'
    _definition.update           2006-11-27
    _definition.class            Attribute
    _description.text
;
    A code identifying the cross-referenced dictionary.
;
    _name.category_id            xref
    _name.object_id              code
    _type.purpose                Key
    _type.container              Single
    _type.contents               Code
     save_


save_dictionary_xref.date
    _definition.id               '_dictionary_xref.date'
    _definition.update           2011-06-27
    _definition.class            Attribute
    _description.text
;
    Date of the cross-referenced dictionary.
;
```

```
    _name.category_id          xref
    _name.object_id            date
    _type.purpose              Audit
    _type.container            Single
    _type.contents             Date
     save_


save_dictionary_xref.format
    _definition.id             '_dictionary_xref.format'
    _definition.update         2011-06-27
    _definition.class          Attribute
    _description.text
;
    Format of the cross referenced dictionary.
;
    _name.category_id          xref
    _name.object_id            format
    _type.purpose              Audit
    _type.container            Single
    _type.contents             Text
     save_


save_dictionary_xref.name
    _definition.id             '_dictionary_xref.name'
    _definition.update         2011-06-27
    _definition.class          Attribute
    _description.text
;
    The name and description of the cross-referenced dictionary.
;
    _name.category_id          xref
    _name.object_id            name
    _type.purpose              Audit
    _type.container            Single
    _type.contents             Text
     save_


save_dictionary_xref.uri
    _definition.id             '_dictionary_xref.uri'
    _definition.update         2011-06-27
    _definition.class          Attribute
    _description.text
;
    The source URI of the cross referenced dictionary data.
;
    _name.category_id          xref
    _name.object_id            uri
    _type.purpose              Audit
    _type.container            Single
    _type.contents             Uri
     save_

     save_    #------- close the DICTIONARY_XREF category

     save_    #------- close the DICTIONARY category


#----------------------------------------------------------------------------


save_ENUMERATION

    _definition.id             ENUMERATION
    _definition.scope          Category
    _definition.class          Set
    _definition.update         2011-06-20
    _description.text
;
    The attributes for restricting the values of defined data items.
;
    _name.category_id              ATTRIBUTES
```

```
    _name.object_id            ENUMERATION


save_enumeration.default
    _definition.id             '_enumeration.default'
    _definition.update         2012-05-07
    _definition.class          Attribute
    _description.text
;
    The default value for the defined item if it is not specified explicitly.
;
    _name.category_id          enumeration
    _name.object_id            default
    _type.purpose              Quantity
    _type.container            Single
    _type.contents             Inherited
     save_


save_enumeration.def_index_id
    _definition.id             '_enumeration.def_index_id'
    _definition.update         2012-05-07
    _definition.class          Attribute
    _description.text
;
    Specifies the data name with a value used as an index to the
    DEFAULT enumeration list (in category enumeration_default)
    in order to select the default enumeration value for the
    defined item. The value of the identified data item must match
    one of the _enumeration_default.index values.
;
    _name.category_id          enumeration
    _name.object_id            def_index_id
    _type.purpose              Identify
    _type.container            Single
    _type.contents             Tag
     save_


save_enumeration.range
    _definition.id             '_enumeration.range'
    _definition.update         2012-05-07
    _definition.class          Attribute
    _description.text
;
    The inclusive range of values "from:to" allowed for the defined item.
;
    _name.category_id          enumeration
    _name.object_id            range
    _type.purpose              Composite
    _type.container            Single
    _type.contents             Range
     save_


save_enumeration.mandatory
    _definition.id             '_enumeration.mandatory'
    _definition.update         2012-05-07
    _definition.class          Attribute
    _description.text
;
    Yes or No flag on whether the enumerate states specified for an
    item in the current definition (in which item appears) MUST be
    used on instantiation.
;
    _name.category_id          enumeration
    _name.object_id            mandatory
    _type.purpose              State
    _type.container            Single
    _type.contents             Code
     loop_
    _enumeration_set.state
    _enumeration_set.detail
                               Yes  'Use of state is mandatory'
```

```
                                        No    'Use of state is unnecessary'
     _enumeration.default              Yes
      save_


#------------------------------------------------------------------------------


save_ENUMERATION_DEFAULT

     _definition.id                    ENUMERATION_DEFAULT
     _definition.scope                 Category
     _definition.class                 Loop
     _definition.update                2011-06-20
     _description.text
;
      Loop of pre-determined default enumeration values indexed to a
      data item by the item _enumeration.def_index_id.
;
     _name.category_id                 ENUMERATION
     _name.object_id                   DEFAULT
     _category.key_id                  '_enumeration_default.index'


save_enumeration_default.index
     _definition.id                    '_enumeration_default.index'
     _definition.update                2011-06-27
     _definition.class                 Attribute
     _description.text
;
      A list of possible values for the item _enumeration.def_index_id
      used to index (select) the enumeration default value from the
      _enumeration_default.value list.
;
     _name.category_id                 default
     _name.object_id                   index
     _type.purpose                     Key
     _type.container                   Single
     _type.contents                    Code
      save_


save_enumeration_default.value
     _definition.id                    '_enumeration_default.value'
     _definition.update                2011-06-27
     _definition.class                 Attribute
     _description.text
;
      A list of possible default enumeration values for the defined item.
      This is selected by the _enumeration_default.index value which
      matches value of the item specified by _enumeration.def_index_id.
;
     _name.category_id                 default
     _name.object_id                   value
     _type.purpose                     State
     _type.container                   Single
     _type.contents                    Inherited
      save_

      save_   #------- close the ENUMERATION_DEFAULT category

#------------------------------------------------------------------------------


save_ENUMERATION_SET

     _definition.id                    ENUMERATION_SET
     _definition.scope                 Category
     _definition.class                 Loop
     _definition.update                2011-06-20
     _description.text
;
      Attributes of data items which are used to define a
      set of unique pre-determined values.
```

```
;
    _name.category_id           ENUMERATION
    _name.object_id             SET
    _category.key_id            '_enumeration_set.state'


save_enumeration_set.state
    _definition.id              '_enumeration_set.state'
    _definition.update          2011-06-27
    _definition.class           Attribute
    _description.text
;
     Permitted value state for the defined item.
;
    _name.category_id           set
    _name.object_id             state
    _type.purpose               Key
    _type.container             Single
    _type.contents              Code
     save_


save_enumeration_set.table_id
    _definition.id              '_enumeration_set.table_id'
    _definition.update          2011-08-02
    _definition.class           Attribute
    _description.text
;
     Permitted id codes in the defined TABLE item {"<id>:<val>,...}.
;
    _name.category_id           set
    _name.object_id             table_id
    _type.purpose               Quantity
    _type.container             Single
    _type.contents              Code
     save_


save_enumeration_set.detail
    _definition.id              '_enumeration_set.detail'
    _definition.update          2011-06-27
    _definition.class           Attribute
    _description.text
;
     The meaning of the code (identified by _enumeration_set.state)
     in terms of the value of the quantity it describes.
;
    _name.category_id           set
    _name.object_id             detail
    _type.purpose               Describe
    _type.container             Single
    _type.contents              Text
     save_


save_enumeration_set.xref_code
    _definition.id              '_enumeration_set.xref_code'
    _definition.update          2011-06-27
    _definition.class           Attribute
    _description.text
;
     Identity of the equivalent item in the dictionary
     referenced by the DICTIONARY_XREF attributes.
;
    _name.category_id           set
    _name.object_id             xref_code
    _type.purpose               Audit
    _type.container             Single
    _type.contents              Code
     save_


save_enumeration_set.xref_dictionary
    _definition.id              '_enumeration_set.xref_dictionary'
```

```
        _definition.update          2011-06-27
        _definition.class           Attribute
        _description.text
;
        Code identifying the dictionary in the DICTIONARY_XREF
        list.
;
        _name.category_id           set
        _name.object_id             xref_dictionary
        _type.purpose               Audit
        _type.container             Single
        _type.contents              Code
         save_

        save_    #------- close the ENUMERATION_SET category

        save_    #------- close the ENUMERATION category

#--------------------------------------------------------------------------


save_IMPORT
        _definition.id              IMPORT
        _definition.scope           Category
        _definition.class           Set
        _definition.update          2011-06-27
        _description.text
;
        Used to import the values of specific attributes from other dictionary
        definitions within and without the current dictionary.
;
        _name.category_id           ATTRIBUTES
        _name.object_id             IMPORT


save_import.file_id
        _definition.id              '_import.file_id'
        _definition.update          2011-06-27
        _definition.class           Attribute
        _description.text
;
        The file name/URI of the source dictionary
;
        _name.category_id           import
        _name.object_id             file_id
        _type.purpose               Identify
        _type.container             Single
        _type.contents              Uri
         save_


save_import.frame_id
        _definition.id              '_import.frame_id'
        _definition.update          2011-06-27
        _definition.class           Attribute
        _description.text
;
        The framecode of the definition frame to be imported.
;
        _name.category_id           import
        _name.object_id             frame_id
        _type.purpose               Identify
        _type.container             Single
        _type.contents              Code
         save_


save_import.mode
        _definition.id              '_import.mode'
        _definition.update          2011-08-03
        _definition.class           Attribute
        _description.text
;
        Action taken with enclosing definition save frame
```

```
         when importing. "Full" imports entire defn frame;
         "Contents" does not import the enclosing save frame.
    ;
         _name.category_id            import
         _name.object_id              mode
         _type.purpose                State
         _type.container              Single
         _type.contents               Code
          loop_
         _enumeration_set.state
         _enumeration_set.detail
                           Full      'import requested definition with frame'
                           Contents 'import contents of requested defn frame'
         _enumeration.default         Contents
          save_


    save_import.if_dupl
         _definition.id               '_import.if_dupl'
         _definition.update           2006-11-16
         _definition.class            Attribute
         _description.text
    ;
         Action taken if the definition block requested already exists
         in the importing dictionary.
    ;
         _name.category_id            import
         _name.object_id              if_dupl
         _type.purpose                State
         _type.container              Single
         _type.contents               Code
          loop_
         _enumeration_set.state
         _enumeration_set.detail
                           Ignore  'ignore imported definitions if id conflict'
                           Replace 'replace existing with imported definitions'
                           Exit    'issue error exception and exit'
         _enumeration.default         Exit
          save_



    save_import.if_miss
         _definition.id               '_import.if_miss'
         _definition.update           2006-11-16
         _definition.class            Attribute
         _description.text
    ;
         Action taken if the definition block requested is missing
         from the source dictionary.
    ;
         _name.category_id            import
         _name.object_id              if_miss
         _type.purpose                State
         _type.container              Single
         _type.contents               Code
          loop_
         _enumeration_set.state
         _enumeration_set.detail
                                 Ignore    'ignore import'
                                 Exit      'issue error exception and exit'
         _enumeration.default         Exit
          save_



    save_import.get
         _definition.id               '_import.get'
         _definition.update           2012-01-25
         _definition.class            Attribute
         _description.text
    ;
         A table of attributes defined individually in the category IMPORT,
         used to import definitions from other dictionaries.
    ;
         _name.category_id            import
         _name.object_id              get
```

```
    _type.purpose             Import
    _type.container           List[Table]
    _type.contents            Table
     loop_
    _enumeration_set.table_id
    _enumeration_set.detail
                        file  'filename/URI of source dictionary'
                        save  'save framecode of source definition'
                        mode  'mode for including save frames'
                        dupl  'option for duplicate entries'
                        miss  'option for missing duplicate entries'
     loop_
    _method.purpose
    _method.expression
     Evaluation
;
     With  i  as  import

    _import.get = [{"file":i.file_id, "save":i.frame_id, "mode":i.mode,
                    "dupl":i.if_dupl, "miss":i.if_miss}]
;
     save_

     save_    #----- close the IMPORT category


    #------------------------------------------------------------------------


    save_LOOP

        _definition.id           LOOP
        _definition.scope        Category
        _definition.class        Set
        _definition.update       2011-06-20
        _description.text
;
        Attributes for looped lists.
;
        _name.category_id        ATTRIBUTES
        _name.object_id          LOOP


    save_loop.level
        _definition.id           '_loop.level'
        _definition.update       2012-05-07
        _definition.class        Attribute
        _description.text
;
        Specifies the level of the loop structure in which a defined
        item must reside if it used in a looped list.
;
        _name.category_id        loop
        _name.object_id          level
        _type.purpose            Quantity
        _type.container          Single
        _type.contents           Index
        _enumeration.range       1:
        _enumeration.default     1
         save_

         save_    #----- close the LOOP category


    #------------------------------------------------------------------------


    save_METHOD

        _definition.id           METHOD
        _definition.scope        Category
        _definition.class        Loop
        _definition.update       2011-06-20
        _description.text
```

```
;
      Methods used for evaluating, validating and defining items.
;
     _name.category_id          ATTRIBUTES
     _name.object_id            METHOD
     _category.key_id           '_method.purpose'


save_method.purpose
     _definition.id             '_method.purpose'
     _definition.update          2006-11-16
     _definition.class           Attribute
     _description.text
;
      The purpose and scope of the method expression.
;
     _name.category_id          method
     _name.object_id            purpose
     _type.purpose              State
     _type.container            Single
     _type.contents             Code
      loop_
     _enumeration_set.state
     _enumeration_set.detail
      Evaluation     "method evaluates an item from related item values"
      Definition     "method generates attribute value(s) in the definition"
      Validation     "method compares an evaluation with existing item value"
     _enumeration.default        Evaluation
      save_


save_method.expression
     _definition.id             '_method.expression'
     _definition.update          2006-11-16
     _definition.class           Attribute
     _description.text
;
      The method expression for the defined item.
;
     _name.category_id          method
     _name.object_id            expression
     _type.purpose              Method
     _type.container            Single
     _type.contents             Text
      save_

      save_      #----- close the METHOD category

#--------------------------------------------------------------------------


save_NAME

     _definition.id             NAME
     _definition.scope          Category
     _definition.class          Set
     _definition.update         2011-06-20
     _description.text
;
      Attributes for identifying items and item categories.
;
     _name.category_id          ATTRIBUTES
     _name.object_id            NAME


save_name.object_id
     _definition.id             '_name.object_id'
     _definition.update          2011-07-27
     _definition.class           Attribute
     _description.text
;
      The object name of a category or name unique within the
      category or family of categories.
;
```

```
    _name.category_id           name
    _name.object_id             object_id
    _type.purpose               Identify
    _type.container             Single
    _type.contents              Name
     save_


save_name.category_id
    _definition.id              '_name.category_id'
    _definition.update          2011-07-27
    _definition.class           Attribute
    _description.text
;
    The name of the category in which a category or item resides.
;
    _name.category_id           name
    _name.object_id             category_id
    _type.purpose               Identify
    _type.container             Single
    _type.contents              Name
     save_


save_name.linked_item_id
    _definition.id              '_name.linked_item_id'
    _definition.update          2011-12-08
    _definition.class           Attribute
    _description.text
;
    Name of an equivalent item in another category which has a
    common set of values, or, in the definition of a type Su
    item is the name of the associated Measurement item to
    which the standard uncertainty applies.
;
    _name.category_id           name
    _name.object_id             linked_item_id
    _type.purpose               Identify
    _type.container             Single
    _type.contents              Tag
     save_

     save_    #----- close the NAME category

#------------------------------------------------------------------------


save_TYPE

    _definition.id              TYPE
    _definition.scope           Category
    _definition.class           Set
    _definition.update          2011-06-26
    _description.text
;
    Attributes which specify the 'typing' of data items.
;
    _name.category_id           ATTRIBUTES
    _name.object_id             TYPE


save_type.container
    _definition.id              '_type.container'
    _definition.update          2011-12-01
    _definition.class           Attribute
    _description.text
;
    The CONTAINER type of the defined data item value.
;
    _name.category_id           type
    _name.object_id             container
    _type.purpose               State
    _type.container             Single
    _type.contents              Code
```

```
       loop_
     _enumeration_set.state
     _enumeration_set.detail
         Single    'a single value'
         Multiple  'values related by boolean ',|&!*' or range ":" ops'
         List      'list of values bounded by []; separated by commas'
         Array     'array of values bounded by []; separated by commas'
         Matrix    'matrix of values bounded by []; separated by commas'
         Table     'id:value elements bounded by {}; separated by commas'
         Implied   'implied by type.container of associated value'
         Ref-table '''Is a STAR construction with key:value elements
                    bounded by ${..}$ and separated by commas.
                    The id tags are privileged and optional.
                    source  - filename or URI
                    block   - data blockname
                    frame   - framecode or [framecode,framecode,..]
                    item    - dataname or [dataname,dataname,..]
                    key     - key value if item is in a list '''
     _enumeration.default       Single
      save_


 save_type.contents
     _definition.id            '_type.contents'
     _definition.update         2012-05-07
     _definition.class          Attribute
     _description.text
;
     Used to specify the syntax construction of value elements of the
     defined object. The syntax is specified in terms of fixed regex
     constructs that have been enumerated as states. Values with more
     than one element may be specified as a list of multiple states.
     Note that this list may contain states related by boolean or range
     operators. The typing of elements is determined by the replication
     of the minimum set of states declared.
;
     _name.category_id          type
     _name.object_id            contents
     _type.purpose              State
     _type.container            Multiple
     _type.contents             Code
      loop_
     _enumeration_set.state
     _enumeration_set.detail
      Inherited    'type inherited from referenced item'
      Text         'a case-sensitive string/lines of text'
      Name         'case-insensitive name of alpha-num chars and underscore'
      Tag          'case-insensitive data tag'
      Table        'table "id":"value" pairs all assumed to be text'
      Filename     'name of an external file'
      Code         'code used for indexing data or referencing data resources'
      Date         'ISO date format yyyy-mm-dd'
      Uri          'an universal resource indicator string specifying a file'
      Version      'version digit string of the form <major>.<version>.<update>'
      Dimension    'integer dimensions of an array in square brackets'
      Range        'An inclusive range of numerical values min:max'
      Digit        'a single digit unsigned number'
      Count        'an unsigned integer number'
      Index        'an unsigned non-zero integer number'
      Digit        'a single digit unsigned number'
      Count        'an unsigned integer number'
      Index        'an unsigned non-zero integer number'
      Integer      'a positive or negative integer number'
      Float        'a floating-point real number'
      Real         'a floating-point real number'
      Imag         'a floating-point imaginary number'
      Complex      'a complex number <R>+j<I>'
      Binary       'a binary number \b<N>'
      Hexadecimal  'a hexadecimal number \x<N>'
      Octal        'a octal number \o<N>'
      loop_
     _description_example.case
     _description_example.detail
         'Integer'         'elements are integer'
```

```
            'List(Real,Code)' 'elements in muliples of real number and codes'
            'Real|Code'        'elements either a real number or a code'
        save_


    save_type.purpose
        _definition.id             '_type.purpose'
        _definition.update          2012-05-07
        _definition.class           Attribute
        _description.text
;
        The primary purpose or function the defined data item serves in a
        dictionary or a specific data instance.
;
        _name.category_id           type
        _name.object_id             purpose
        _type.purpose               State
        _type.container             Single
        _type.contents              Code
        loop_
        _enumeration_set.state
        _enumeration_set.detail

        Import
;                       >>> Applied ONLY in the DDLm Reference Dictionary <<<
                        Used to type the SPECIAL attribute "_import.get" that
                        is present in dictionaries to instigate the importation
                        of external dictionary definitions.
;
        Method
;                       >>> Applied ONLY in the DDLm Reference Dictionary <<<
                        Used to type the attribute "_method.expression" that
                        is present in dictionary definitions to provide the
                        text method expressing the defined item in terms of
                        other defined items.
;
        Audit
;                       >>> Applied ONLY in the DDLm Reference Dictionary <<<
                        Used to type attributes employed to record the audit
                        definition information (creation date, update version and
                        cross reference codes) of items, categories and files.
;
        Identify
;                       >>> Applied ONLY in the DDLm Reference Dictionary <<<
                        Used to type attributes that identify an item tag (or
                        part thereof), save frame or the URI of an external file.
;

    #...............the PURPOSE types used in all dictionaries ...........

        Extend
;                       *** Used to EXTEND the DDLm Reference Dictionary ***
                        Used in a definition, residing in the "extensions"
                        save frame of a domain dictionary, to specify a new
                        enumeration state using an Evaluation method.
;
        Describe
;                       Used to type items with values that are descriptive
                        text intended for human interpretation but may be
                        specially formatted to be machine parsible.
;
        State
;                       Used to type items with values that are restricted to
                        codes present in their "enumeration_set.state" lists.
;
        Key
;                       Used to type an item with a value that is unique within
                        the looped list of these items, and may be used as a
                        reference "key" to identify a specific packet of items
                        within the category.
;
        Link
;                       Used to type an item with a value that is unique within
                        a looped list of items belonging to another category.
```

```
                      The definition of this item must contain the attribute
                      "_name.linked_item_id" specifying the data name of the
                      key item for this list. The defined item represents a
                      a foreign key linking packets in this category list to
                      packets in another category.
;
        Composite
;                     Used to type items with value strings composed of
                      separate parts. These will usually need to be separated
                      and parsed for complete interpretation and application.
;
        Quantity
;                     Used to type an item with a recorded value, numerical
                      or otherwise, that is exact (i.e. it has no standard
                      uncertainty value). Typical examples: "5","A","blue"
;
        Measurand
;                     Used to type an item with a numerically estimated value
                      that has been recorded by measurement or derivation. This
                      value must be accompanied by its standard uncertainty
                      (SU) value, expressed either as:
                        1) appended integers, in parentheses (), at the
                           precision of the trailing digits,        or
                        2) a separately defined item with the same name as the
                           measurand item but with an additional suffix '_su'.
;
        SU
;                     Used to type an item with a numerical value that is the
                      standard uncertainty of an item with the identical name
                      except for the suffix '_su'. The definition of an SU item
                      must include the attribute "_name.linked_item_id" which
                      explicitly identifies the associated measurand item.
;
     save_


save_type.source
    _definition.id              '_type.source'
    _definition.update          2012-05-07
    _definition.class           Attribute
    _description.text
;
     The origin or source of the defined data item, indicating by what
     recording process it has been added to the domain instance.
;
    _name.category_id           type
    _name.object_id             source
    _type.purpose               State
    _type.container             Single
    _type.contents              Code
     loop_
    _enumeration_set.state
    _enumeration_set.detail

        Assigned
;                     A quantity, as either an exact number or text value,
                      assigned as a record of the data collected, analysed
                      or modelled for a domain instance. This is a PRIMITIVE
                      data item, in that this item cannot be determined
                      from other defined items.
;
        Observed
;                     A quantity, as either an exact number or text value,
                      that records an observation made during the collection
                      of data for a domain instance. This item is PRIMITIVE.
;
        Measured
;                     A numerical value measured manually or instrumentally
                      with an associated standard uncertainty value for a
                      domain instance. This item is PRIMITIVE.
;
        Derived
;                     A quantity derived from other data items within the
                      domain instance. This item is NOT PRIMITIVE.
```

```
;
      Selected
;                A quantity selected arbitrarily to identify a packet of
                 data present in a loop list. The quantity has no intrinsic
                 meaning other than it being a unique string. This is
                 in contrast to Assigned items whose values can determine
                 derivation outcomes.  This item is NOT PRIMITIVE.
;
      Assembled
;                A quantity that has been assembled or syntactically
                 composed as a preferred representation of other data
                 items for the domain instance. An assembled item is
                 in a sense redundant, and therefore NOT PRIMITIVE.
;
      save_


save_type.dimension
     _definition.id                '_type.dimension'
     _definition.update             2012-05-07
     _definition.class              Attribute
     _description.text
;
     The dimensions of a list or matrix of elements as a text string
     within bounding square brackets.
     The syntax of the dimension text string is:
         - an integer 'n' sets either the number of elements, or the
           number of nests of elements when followed by a "[...]" sequence.
         - an asterisk "*" signals an indeterminant number of elements.
           The TYPE of the contained elements is identified in _type.contents.
;
     _name.category_id             type
     _name.object_id               dimension
     _type.purpose                 Composite
     _type.container               Single
     _type.contents                Text
      loop_
     _description_example.case
     _description_example.detail
           "[[Real*3],[Real*2],[Real*1]]" 'a lower triangular matrix'
           "[[Real*3]*3]"                  'a 3x3 matrix of reals'
           "[Integer*6]"                   'in list of 6 integer numbers'
           "[Integer,Text*4]"              '5 element list, in 4 text elements'
           "[]"                            'unknown number of list elements'
      save_

      save_    #-------- close the TYPE category

   #----------------------------------------------------------------------------


save_UNITS

     _definition.id              UNITs
     _definition.scope           Category
     _definition.class           Set
     _definition.update          2011-06-22
     _description.text
;
     The attributes for specifying units of measure.
;
     _name.category_id             ATTRIBUTES
     _name.object_id               UNITS


save_units.code
     _definition.id              '_units.code'
     _definition.update           2012-01-25
     _definition.class            Attribute
     _description.text
;
     A code which identifies the units of measurement.
;
     _name.category_id             units
```

```
    _name.object_id               code
    _type.purpose                 State
    _type.container               Single
    _type.contents                Code
    _import.get     [{"file":'templ_enum.cif',"save":'units_code'}]
     save_

     save_      #--------- close the UNITS category

     save_      #--------- close the ATTRIBUTES category



#===============================================================================
#  The attribute validation criteria for application to a domain dictionary
#===============================================================================

     loop_
   _dictionary_valid.application
   _dictionary_valid.attributes

  ["Dictionary","Mandatory"]     ["_dictionary.title",
                                  "_dictionary.class",
                                  "_dictionary.version",
                                  "_dictionary.date",
                                  "_dictionary.uri",
                                  "_dictionary.ddl_conformance",
                                  "_dictionary.namespace"]

  ["Dictionary","Recommended"]  ["_description.text",
                                  "_dictionary_audit.version",
                                  "_dictionary_audit.date",
                                  "_dictionary_audit.revision"]

  ["Dictionary","Prohibited"]    ["ALIAS",
                                  "CATEGORY",
                                  "DEFINITION",
                                  "ENUMERATION",
                                  "LOOP",
                                  "METHOD",
                                  "NAME",
                                  "TYPE",
                                  "UNITS"]

  ["Category","Mandatory"]       ["_definition.id",
                                  "_definition.scope",
                                  "_definition.class",
                                  "_name.category_id",
                                  "_name.object_id"]

  ["Category","Recommended"]     ["_category.key_id",
                                  "_description.text"]

  ["Category","Prohibited"]      ["ALIAS",
                                  "DICTIONARY",
                                  "ENUMERATION",
                                  "IMPORT",
                                  "LOOP",
                                  "TYPE",
                                  "UNITS"]

   ["Item","Mandatory"]          ["_definition.id",
                                  "_definition.update",
                                  "_name.object_id",
                                  "_name.category_id",
                                  "_type.purpose",
                                  "_type.container",
                                  "_type.contents"]

   ["Item","Recommended"]        ["_definition.scope",
                                  "_definition.class",
                                  "_type.source",
                                  "_description.text",
```

"_description.common"]

      ["Item","Prohibited"]   ["CATEGORY",
                                          "DICTIONARY"]

#==
The dictionary's audt trail and creation history.
#==

       loop_
      _dictionary_audit.version
      _dictionary_audit.date
      _dictionary_audit.revision

       3.7.13   2011-01-27
;
  Change definition scope of Head category to "Dictionary"
  Remove all tabs and replace with blank string
;
       3.7.14   2011-03-25
;
  In the attribute import_list.id
  Change _type.contents   Tuple(Code,Tag,Uri,Code,Code)
  To   _type.contents   Tuple(Code,Ctag,Uri,Code,Code)
 In the attribute import.block
  Change _type.contents   Tag
  To   _type.contents   Ctag
  And change the case examples
;
       3.8.01   2011-06-07
;
  Remove the Tuple and Array enumerations from _type.container
  Change category class enumeration from List to Loop; and change
  all invocations of _category.class in the definitions
  Introduce nested save frames for expressing nested categories.
;
       3.8.02   2011-06-21
;
Reconfigure _dictionary_valid attribures into lists, and reset the
attribute application criteria at the rear of the DDL dictionary.
;
       3.8.03   2011-06-22
;
Change IMPORT_LIST to IMPORT_TABLE. Change the IMPORT arguments to
match this. Change the import_list.id invocations to import_table
equivalents. Add _enumeration_set.table_tag.
;
       3.8.04   2011-06-23
;
Remove IMPORT_TABLE. Change the IMPORT to a set category.
Insert a import.get attribute to replace import_table.id
Rename the DDL_ATTR category as ATTRIBUTES
;
       3.8.05   2011-06-27
;
Change the _name.category_id value to reflect the parent category.
;
       3.8.06   2011-06-29
;
Change Reference in _type.purpose to Ref-key
;
       3.8.07   2011-06-30
;
Change Reference in _definition.class to Ref-loop.
Remove import from type.contents and insert enumeration_set list.
Insert name.category_id into every category definition.
;
       3.8.08   2011-07-28
;
Add name.category_id and name.object_id to category definitions.
Remove category.parent_id from category definitions.
Remove definitions for category.parent_id and the CATEGORY_KEY
and CATEGORY_MANDATORY definitions. Define category.key_id
;

```
      3.8.08   2011-08-15
;
Add the state "Extend" to the type.purpose" attribute.
;
      3.9.01   2011-12-08
;
Add types "Array" and "Matrix" to type.container attribute definition.
Add type "Su" to the type.purpose attribute definition.
;
      3.9.02   2012-01-25
;
For import.get change the key "fram" to "save".
;
      3.10.01 2012-05-07
;
Revamp the type.purpose states. Remove state "Limit"
Add the new attribute type.source
Change dictionary.class "Attribute" to "Reference"
Removed attribute enumeration_set.construct
;
```