EUROPEAN COMMISSION
DIRECTORATE-GENERAL FOR MARITIME AFFAIRS AND FISHERIES

MEDITERRANEAN AND BLACK SEA
Integrated Fisheries Data Management

THE INTEGRATED FISHERIES DATA MANAGEMENT PROGRAMME

Subject: FLUX Master Data Management Implementation Document – v3.0.0

1. INTRODUCTION

This document describes the implementation of the MDM UN/CEFACT international standard in the context of an **European Union** usage.

2. GLOSSARY

BR	Business rule
MDM	Master Data Management
MDR	Master Data Register of DG MARE

3. LEGAL BASIS

For the content of the Master Data Register: all EU regulations defining or referencing a code list stored in the MDR.

For the use of FLUX MDM messages: there is no legal basis to use the FLUX P1000-10 MDM Domain. The submission of MDM messages to query the MDR is on a voluntary basis.

4. REFERENCES[1]

The following documents and data structures are directly linked and should be read in connection to this Implementing Guide:

Standard	Version
FLUX BRS: P1000 – 1; General principles	2.1

Sales UN/CEFACT XSD
FLUXMDRQueryMessage_14p0
FLUXMDRReturnMessage_14p1

The documents are available on the Master Data Register page of the European Commission Fisheries website[2].

[1] All referenced documents are on the MDR Europa: http://ec.europa.eu/fisheries/cfp/control/codes/index_en.htm

[2] http://ec.europa.eu/fisheries/cfp/control/codes/index_en.htm

5. SCOPE AND STAKEHOLDERS

5.1. Scope

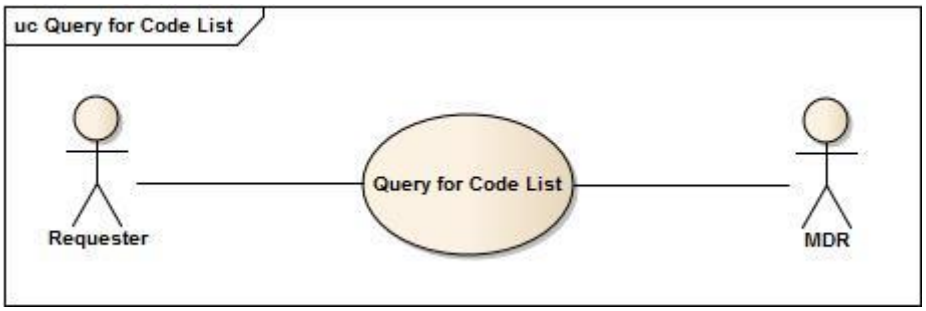

Figure 1: Implementing Guide Scope diagram

As shown on Figure 1, a requester can query for getting a Code List content or information from the MDR. This document concentrates on data exchanges related to this context.

5.2. Stakeholders

Any party using the Transportation layer and able to communicate with MARE.

6. PROCEDURES

6.1. Assumptions

The exchange of the business messages described in this document will be done through the FLUX Transportation Layer for which technical and functional documentations have been already published on the Master Data Register (MDR) page of the European Commission Fisheries website[3].

Furthermore, it is assumed that data exchanges are fully automated and immediate. No human approval or intervention should be needed for data exchanges of well-formed messages for which the business rules are defined in this document.

6.2. General principles

The following activity diagram describes the normal procedure defined for submitting MDM Query Messages from a Requester to the European Commission. This procedure respects the FLUX General Principles transmission procedure:

[3] http://ec.europa.eu/fisheries/cfp/control/codes/index_en.htm

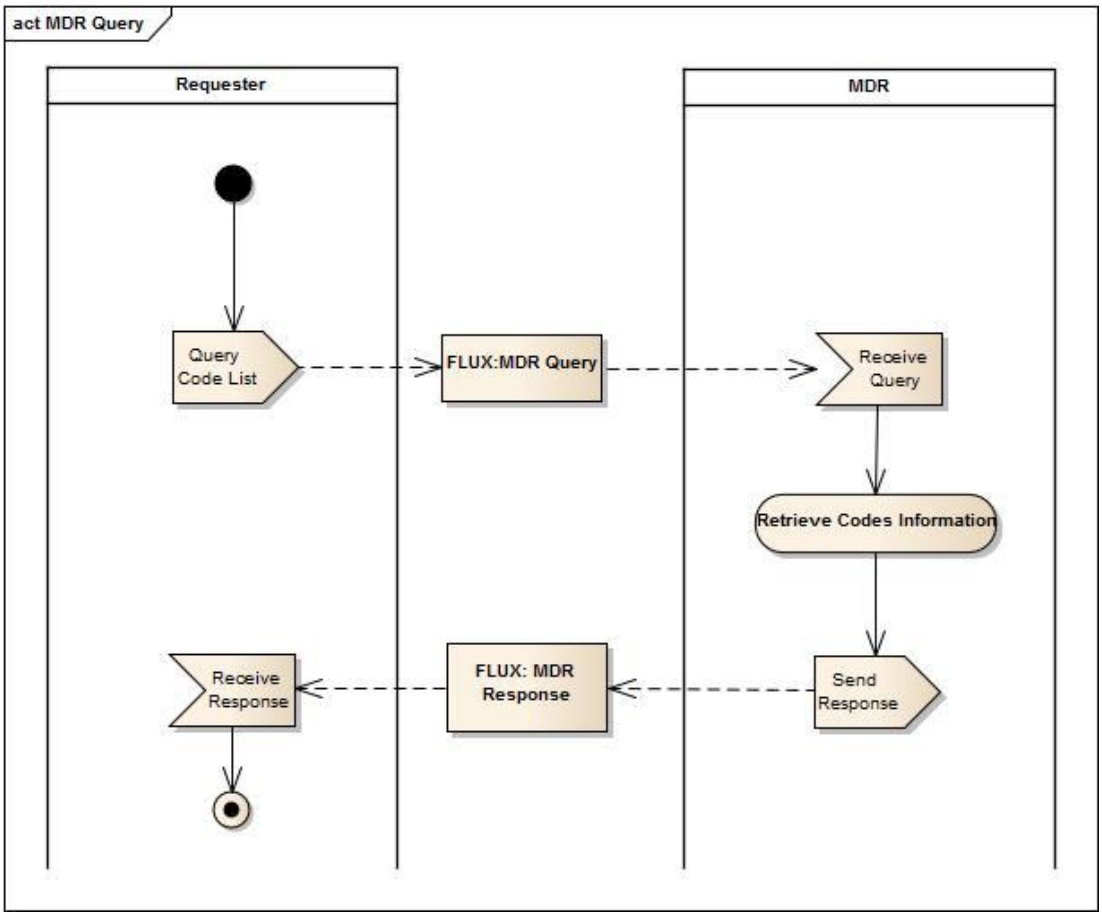

Figure 2: Query Message Transmission activity diagram

6.2.1. Business rules

Messages must be validated by the receiver upon receipt of a message.

The validation process validates on two levels:

(1) XML Validation level: Based on the definition in the XSD[4], the parser validates the structure and cardinality as well as compliance for mandatory elements of the XML provided[5].

(2) Business Rules Validation level: a process validates the content of XML according to, firstly, the General Principles Business Rules definition and, secondly, to all other specific business rules defined in the domain.

[4] The XSD considered for the validation process is the standard UN/CEFACT XSD for the MDM domain, defined in standard P1000-10.

[5] In general, only XSD elements are defined as mandatory. Element ListIDs and facets remain optional.

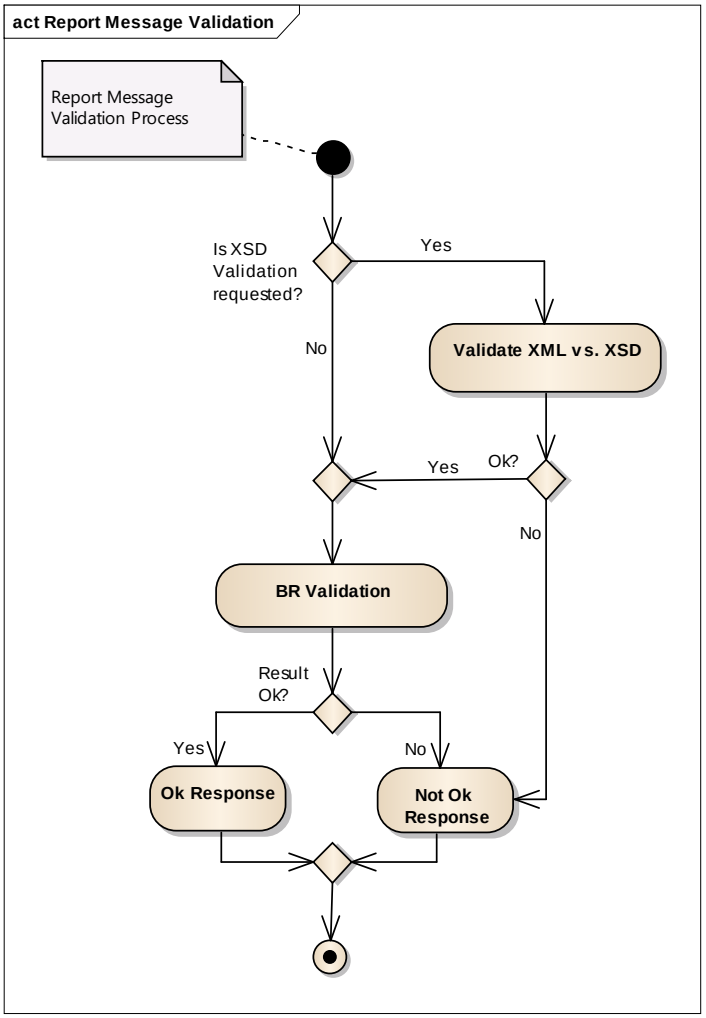

Figure 3 ; FLUX MDM Query Message validation

For the validation, business rules are classified in two data sets:

Validation data set: rules are applied immediately when a party receives a message. The following types of rules fall under this category:

- Structural validations: the message must be valid according to the standard UN/CEFACT XSD for the MDM domain;
- Mandatory fields: they must be present in the message; There is no need for the recipient of the message to validate entities or attributes that are not defined in this implementation document.
- Business validations: described in the chapter 8;

Verification data set: rules that could be applied on data after forwarding the message. There is no such rules for this implementation document.

When the exchange in an automatic and immediate way is not possible or when exchanged messages cannot be understood by the receiver, the manual fall back procedure must be engaged.

The Response message returned to the requester has a unique structure which contains, depending on the results of the validation, either a message with information and data elements belonging to the requested list of code(s) or a message containing the Error code and description.

6.2.2. A standard code list registration in MDR

Any public[6] code list must be referenced in the INDEX code list of MDR with at least one[7] unique alias (a technical identifier) called also acronym. The validity period of the list (his life time based on start/end dates) is also defined at that level.

The content of the list is based on a set of codes with specific additional attributes. Each code has also a validity period (his life time).

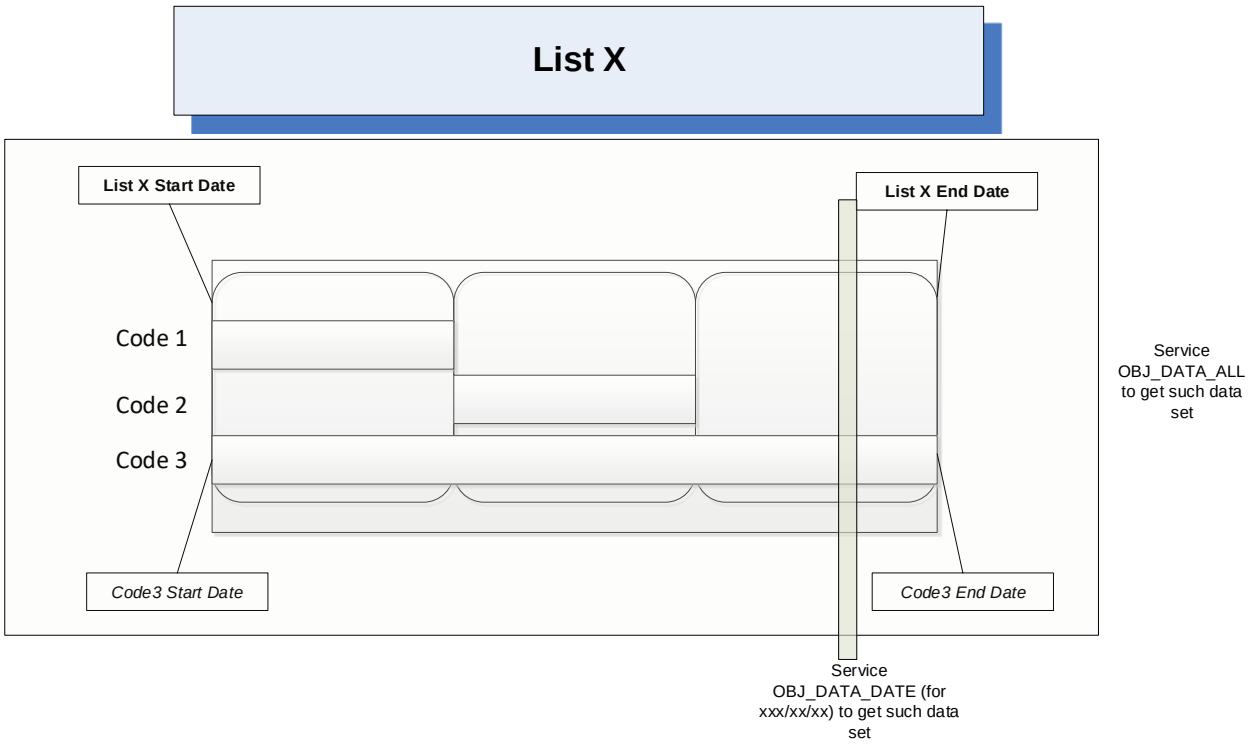

Figure 4: classical registration of a code list in MDR

[6] list accessible by FLUX requests. MDR contains also private lists used by DG MARE applications only and accessed by other means than FLUX requests.

[7] Multiple aliases for a code list are possible if each of them is unique in MDR

6.3. FLUX MDR Query Message

The following services can be requested in query messages:

6.3.1. OBJ_DATA_ALL

Goal: To get the full content of a specific list with all codes.

Parameter:

- The alias[8] of the list (ex. FLUX_UNIT): mandatory;
- The language code (for the descriptions): optional[9];

Output: The data are classified in two groups:

1. The meta data of the list:
    a. The alias of the list;
    b. The name of the list (business oriented);
2. The content of the list: This part is specific to the requested list:
    a. The Code
    b. The Code Description: in the language provided as parameter. If the information is not available the English language is used.
    c. The Validity Start Date of the code
    d. The Validity End Date of the code
    e. <specific data of the list in which the code is valid >

Limitations: This service targets each time one and only one object from the MDR.

[8] From the "Index" entity in the MDR. It is a unique technical identifier of the list.

[9] If provided, only EN (for english) is supported. Other values are ignored.

6.3.2. OBJ_DATA_DATE

This service is particularly useful for validation processes.[10]

Goal: To get the content of a specific list for which all codes are valid at a certain date.

Parameter:

- The alias[11] of the list (ex. FLUX_UNIT);
- The language code (for the descriptions): optional[12];

Output: The data are classified in two groups:

1. The meta data of the list:
    a. The alias of the list;
    b. The name of the list (business oriented);
2. The content of the list: This part is specific to the requested list:
    a. The Code;
    b. The Code Description: in the language provided as parameter. If the information is not available the English language is used.
    c. The Validity Start Date of the code
    d. The Validity End Date of the code
    e. < specific data of the list in which the code is valid>

Limitations: The web service targets each time one and only one object from the MDR.

[10] Cfr implementation documents of other FLUX domains like Fishing Activities, Sales, Vessel …

[11] From the "Index" entity in the MDR. It is a unique technical identifier of the list.

[12] If provided, only EN (for english) is supported. Other values are ignored.

6.3.3. OBJ_NEWS

Goal: This service is mainly used to know what were the changes in a code list from the MDR after a certain date to allow the requester to perform incremental updates of their local MDR.

Parameter:

- The alias of the list:
    - INDEX: If the alias "INDEX" is used as parameter, the service will return all new codes that have been inserted in MDR in all public lists since the date given as second parameter.
    - An alias of a code list: If an alias of a code list is used as parameter, the service will return all new codes that have been inserted in MDR since the date given as second parameter in that public list.
- A date from which new codes have been introduced in MDR;

Output: a list of all codes for which the validation start date is equal or later than the date given in parameter.

a. The alias(es) of the list;

b. The name of the list (business oriented);

For each entry in the list corresponding to the criteria:

c. The Code;

d. The Code Description: in the language provided as parameter. If the information is not available the English language is used.

e. The Validity Start Date of the code

f. The Validity End Date of the code

g. < specific data of the list in which the code is valid>

6.3.4. OBJ_DESC:

Goal: To get the description of each attribute of a code list.

Parameter:

- The alias[13] of the list (ex. FLUX_UNIT);
- The language code (for the descriptions): optional[14];

Output:

a. The alias of the list;

b. The name of the list (business oriented);

c. The Validity Start Date of the list;

d. The Validity End Date of the list;

e. The list of attributes with their names (in the MDR database and in the user interface);

Limitations: The web service targets each time one and only one object from the MDR.

[13] From the "Index" entity in the MDR. It is a unique technical identifier of the list.

[14] If provided, only EN (for english) is supported. Other values are ignored.

7. DATA MODEL (XSD) IMPLEMENTATION

The implementation of the Sales Data Model[15] should follow the following general constraints at the level of XSD Element attributes:

(1) For Code & Identifier DataType: *listID* or *schemeID* attribute must be provided respectively if it is not specifically defined in the definition of the element;

(2) For DateTime DataType: only xs:datetime choice is used and 'Z' character defining UTC time zone must be set;

(3) Measure DataType: the unitCode attribute shall be provided when not explained in the definition.

Only the entities and/or attributes listed in the Implementation Document must be considered by the receiving party.

[15] The data model presented in the document is a sub-set of the complete UN/CEFACT data model, which is relevant to the MDM domain

7.1. The FLUX MDR Query Message

The following diagram describes the MDM Data Model used for the implementation of transmission of FLUX MDR Query Message:

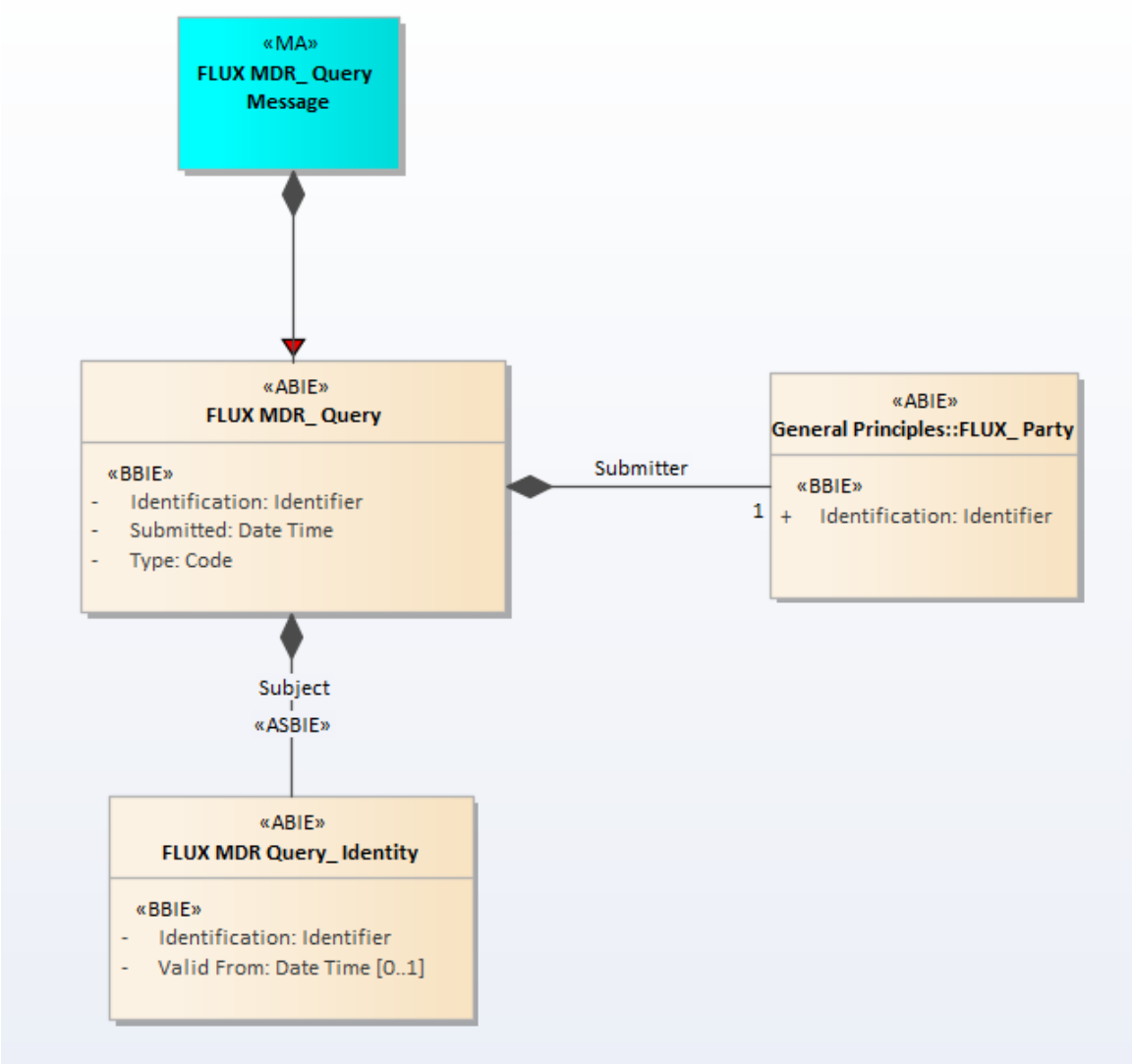

Figure 5: class diagram FLUX MDR Query Message

Tables below describes for each fields defined in the Data Model (XSD) the values that can be used.

7.1.1. FLUX MDR_Query

Description: The type of query which is used.

Entity/Field Name	DataType	Cardinality		Description	Remarks
		min	max		
Identification	Identifier	1	1	The unique identifier for this FLUX MDR query.	*schemeID*= **UUID** + value a UUID as defined in the RFC 4122
Submitted	DateTime	1	1	A date time value when this MDR query was submitted.	A UTC date time according to ISO 8601 format; e.g. 2008-10-31T15:07:38.6875000Z.
Type	Code	1	1	A code specifying the type of the query (service).	*listID*=FLUX_MDR_QUERY_TYPE One of the following values: • OBJ_DATA_ALL: all data of a list. • OBJ_DATA_DATE: a list valid at a given date. • OBJ_DESC: the description of the list (code elements will contain fields and their description) OBJ_NEWS: info on codes created after a certain date
FLUX_Party	Ass.	1	1	The party sending the request	
MDR Query Identity	Ass	1	1	Value of query parameters	

7.1.2. FLUX_Party

Description: The party sending the request.

Entity/Field Name	DataType	Cardinality		Description	Remarks
		min	max		
Identification	Identifier	1	1	The Alpha3 ISO Country Code of the sender	*schemeID*=FLUX_GP_PARTY + value

7.1.3. MDR Query_Identity

Description: The value of the possible parameters of this query.

Entity/Field Name	DataType	Cardinality		Description	Remarks
		min	max		
Identification	Identifier	1	1	The unique identifier of a code list in MDR	*schemeID*=INDEX + value Alias (called also acronym) of a code list as defined in MDR in the INDEX code list
Valid From	Date	0	1	A date used to get the content of the list valid at that date.	A UTC date time according to ISO 8601 format; e.g. 2008-10-31 Must be only provided for the query type OBJ_DATA_DATE & OBJ_NEWS

7.2. FLUX MDR Return Message

The following diagram describes the FLUX General Principle Response Data Model used for the implementation of a response to a query message:

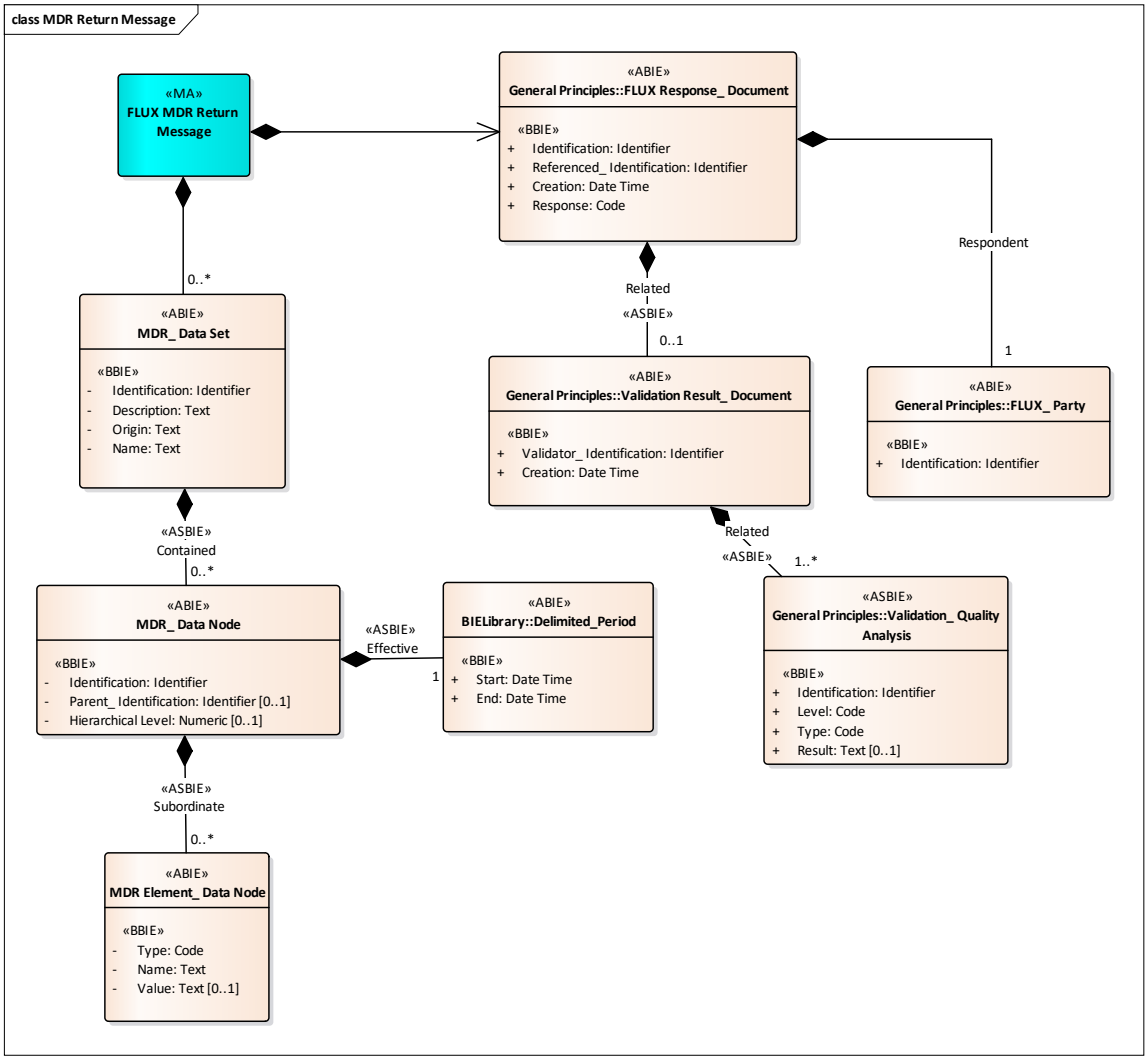

Figure 6: class diagram FLUX MDR Return Message

Table below describes for each fields defined in the Data Model (XSD) the values that can be used.

7.2.1. FLUX Response_Document

Description: The response to a query message.

Entity/Field Name	DataType	Cardinality		Description	Remarks
		min	max		
Identification	Identifier	1	1	The unique identifier for this FLUX MDR query.	*schemeID*= UUID + value a UUID as defined in the RFC 4122
Creation	DateTime	1	1	The date time UTC value of the creation of this FLUX Response Message.	A UTC date time according to ISO 8601 format; e.g. 2008-10-31T15:07:38.6875000Z.
Referenced Identification	Identifier	1	1	The identifier of the FLUX Query Message to which this FLUX document responds.	Used for referencing the query message that has been validated. *schemeID*=**UUID** UUID as defined in the RFC 4122. *schemeID*=**FLUXTL_ON** the reference taken from the message envelope in case of a problem with the message resulting on a non-availability of the UUID schemeID values come from the FLUX_GP_MSG_ID code list
Response	Code	1	1	The code indicating the response in this FLUX response document.	*listID*= FLUX_GP_RESPONSE + value e.g. OK, NOK, WOK
FLUX Party	Ass.	1	1	The party sending the response	
Validation Result Document	Ass.	0	1	The validation report	

7.2.2. FLUX_Party

Description: The party sending the response.

Entity/Field Name	DataType	Cardinality		Description	Remarks
		min	max		
Identification	Identifier	1	1	The Alpha3 ISO Country Code of the sender	*schemeID*=FLUX_GP_PARTY + value Always XEU. Code is used for the European Commission.

7.2.3. Validation Result_Document

Description: Document about validation results.

Entity/Field Name	DataType	Cardinality		Description	Remarks
		min	max		
Validator Identification	Identifier	1	1	The Alpha3 ISO Country Code of the sender	*schemeID*= FLUX_GP_PARTY + value Always XEU. Code is used for the European Commission.
Creation	DateTime	1	1	The date time UTC value of the creation of this validation report.	A UTC date time according to ISO 8601 format; e.g. 2008-10-31T15:07:38.6875000Z.
Validation Quality Analysis	Ass.	1	1	Results of the validation process	

7.2.4. Validation_Quality Analysis

Description: Results of the applied business rules.

Entity/Field Name	DataType	Cardinality		Description	Remarks
		min	max		
Identification	Identifier	1	1	Identification of the business rule	*schemeID*=MDM_BR + value
Level	Code	1	1	Validity level in which the business rule is defined	*listID*=FLUX_GP_VALIDATION_LEVEL + value
Type	Code	1	1	Result of the application of the business rules	*listID*=FLUX_GP_VALIDATION_TYPE + value e.g. WAR, ERR

7.2.5. MDR_Data Set

Description: General information about the requested MDR data set.

Entity/Field Name	DataType	Cardinality		Description	Remarks
		min	max		
Identification	Identifier	1	1	The unique identifier for this MDR dataset.	*schemeID*=INDEX + value The alias of the list used in the query message. e.g: CR_UNIT
Description	Text	1	1	The textual description in English for this MDR data set.	e.g.: “List of possible units used in Catch Reporting”
Origin	Text	1	1	The data origin of this MDR data set.	e.g: MARE, FAO…
Name	Text	1	1	The business name of this MDR data set.	e.g: Catch Reporting Unit List
MDR Data Node	Ass.	0	*	Information about the content of the data set	

7.2.6. MDR_Data Node

Description: Information about one entry in the MDR data set.

Entity/Field Name	DataType	Cardinality		Description	Remarks
		min	max		
Identification	Identifier	1	1	The unique identifier for this MDR data node.	Internal MDR key value
Parent Identification	Identifier	0	1	A unique identifier of the parent in case of a hierarchical list.	Internal MDR key value referring to another MDR data node identification
Hierarchical Level	Numeric	0	1	The number (integer) representing how deeply nested within the hierarchical tree structure the MDR data node lies.	Only if part of a hierarchical list. For example, level 1 means it is a top level node, and level 4 means that there are three levels of nodes above this node in the tree.
MDR Data Node Element	Ass.	0	*	Complementary information about an entry in the data node	
Delimited Period	Ass.	1	1	Information about the validity period of the data node	

7.2.7. MDR Element_Data Node

Description: Complementary information about one element of an entry in the MDR data set.

Entity/Field Name	DataType	Cardinality		Description	Remarks
		min	max		
Name	Text	1	1	The name, expressed as text, of this MDR data element. The name is prefixed with the alias of the list where the data element comes from.	e.g. CR_UNIT.CODE
Value	Text	0	1	The value, expressed as text, of this MDR data element.	e.g. COD

Entity/Field Name	DataType	Cardinality		Description	Remarks
		min	max		
Type	Code	1	1	The code specifying the datatype for this MDR data element.	*listID*= DATA_TYPE + value e.g. TEXT, BOOLEAN

7.2.8. Delimited_Period

Description: Information about the validity period of an entry in the MDR data set.

Entity/Field Name	DataType	Cardinality		Description	Remarks
		min	max		
Start	Date	1	1	Start date of the validity of this node.	A UTC date time according to ISO 8601 format but only the date part is used.
End	Date	1	1	End date of the validity of this node.	A UTC date time according to ISO 8601 format but only the date part is used.

8. BUSINESS RULES

Business rules are applied immediately on Flux MDR Query Message when received by the system. Each business rule must be applied if the data is available in the message.

If the parsing of the in-coming message fails because the XML does not comply to the XSD schema, the BR MDM-L00-0000 is communicated in the validation report of the response. The reference of the message in the response will be the FLUXTL_ON reference of the message envelope if the UUID cannot be identified due to the parsing problem.

8.1. General business rules

The following BRs are applied to any MDM messages:

BR-ID	Entity/ Attribute	BR	ERR/ WAR	Message
MDM-L00-00-0000	MDR_Message	Verifies whether or not the message is a valid XML and it can be validated against the XSD schema	ERR	An invalid XML message has been received.

8.2. FLUX MDR_Query Message

BR-ID	Entity/Attribute	BR	ERR/ WAR	Message
MDM-L00-00-0001	MDR_Query/Identification	Must be provided	ERR	The UUID must be provided.
MDM-L00-00-0002	MDR_Query/Identification	Check Format : UUID	ERR	The format of the UUID is invalid.
MDM-L00-00-0003	MDR_Query/Identification	The reference must be unique	ERR	The UUID is not unique.
MDM-L00-00-0004	MDR_Query/Type (service)	Must be provided	ERR	The query type (service name) must be provided
MDM-L01-00-0001	MDR_Query/Type (service)	Code from the specific list	ERR	The requested service is not known
MDM-L00-00-0005	FLUX_Party/Identification	Must be provided	ERR	The FLUX party must be provided

BR-ID	Entity/Attribute	BR	ERR/ WAR	Message
MDM-L01-00-0002	FLUX_Party/Identification	Code from the specific list	ERR	This party is not allowed to send MDR requests.
MDM-L00-00-0006	FLUX_Party/Identification, Transportation layer	The party sending the message must be the same as the one from the FR value of the FLUX TL envelope. Only the part before the first colon is to be considered: Eg. ABC:something => only ABC refers to the party for the purpose of this rule.	ERR	The party in the request is not the same as the sender of the message
MDM-L00-00-0007	MDR Query_Identity/Identification	Must be provided	ERR	The identification of the list must be provided
MDM-L01-00-0003	MDR Query_Identity/Identification	Alias from the INDEX list	ERR	The alias of the requested list is unknown or the list is not publicly accessible
MDM-L00-00-0008	MDR Query_Identity/Valid From	Check format	ERR	The format of the date is invalid
MDM-L01-00-0004	MDR Query_Identity/Valid From	Must be provided for query type OBJ_DATA_DATE and OBJ_NEWS	ERR	The date used for retrieving data is not specified.

8.3. FLUX MDR Return Message

8.3.1. Business rules in relation with the validation of the return message:

BR-ID	Entity/Attribute	BR	ERR/ WAR	Message
MDM-L00-01-0001	FLUX Response/Identification	Must be provided	ERR	The UUID must be provided
MDM-L00-01-0002	FLUX Response/Identification	Check Format : UUID	ERR	The format of the UUID is invalid.
MDM-L00-01-0003	FLUX Response/Identification	The reference must be unique	ERR	The UUID is not unique.
MDM-L00-01-0004	FLUX Response/Creation	Must be provided	ERR	The creation date must be provided
MDM-L00-01-0005	FLUX Response/Creation	Check Format	ERR	The format of the creation date is invalid

MDM-L00-01-0006	FLUX Response/Referenced, Identification	Must be provided	ERR	The referenced identification must exist
MDM-L00-01-0007	FLUX Response, Referenced Identification	Check attribute schemeID. Must be in the FLUX_GP_MSG_ID list	ERR	The format of the UUID is invalid.
MDM-L00-01-0008	FLUX Response, Referenced Identification	It must be a reference of an existing Query Message	ERR	The response references a message which is not a query
MDM-L00-01-0009	FLUX Response/Response	Must be provided	ERR	The response code must exist
MDM-L00-01-0010	FLUX Response/Response	Code from the specific list	ERR	The response code is unknown
MDM-L00-01-0011	FLUX_Party/Identification	Must be provided	ERR	The FLUX party must be provided
MDM-L01-01-0012	FLUX_Party/Identification	XEU	ERR	This party must be XEU (European Commission).
MDM-L00-01-0013	FLUX_Party/Identification, Transportation layer	The identification of the party must be the same as the one sending the request	ERR	The party in the request is not the same as the sender of the message
MDM-L00-01-0014	Validation Quality, Analysis/Identification	Must be provided	ERR	The identification of the business rule must be provided
MDM-L00-01-0015	Validation Quality, Analysis/Identification	Code from the specific list	ERR	The business rule reference is unknown
MDM-L00-01-0016	Validation Quality Analysis/Level	Must be provided	ERR	The validation level must be provided
MDM-L00-01-0017	Validation Quality Analysis/Level	Code from the specific list	ERR	The validation level is unknown
MDM-L00-01-0018	Validation Quality Analysis/Type	Must be provided	ERR	The validation result code must be provided
MDM-L00-01-0019	Validation Quality Analysis/Type	Code from the specific list	ERR	The validation result code is unknown

8.3.2. Business rules in relation with the content of the MDR and what has been requested:

BR-ID	Entity/Attribute	BR	ERR/ WAR	Message
MDM-L01-01-0001	Data from the MDR	No data found	WAR	The request is valid but for the requested list no data can be found.
MDM-L01-01-0002	Data from the MDR	General issue with the MDR	ERR	An unexpected system error occurred. Please contact the administrator.
MDM-L01-01-0020	Data from the MDR	The request is valid but for the requested list no description could be found.	ERR	For the requested list, no description was found. Please contact the administrator.
MDM-L01-01-0021	Data from the MDR	For the requested list, invalid MDR data was found.	ERR	For the requested list, invalid data was found. Please contact the administrator.

9. XML EXAMPLES

XML examples will be provided on the Master Data Register page of the European Commission Fisheries website[3].

10. CODE LISTS

All XSDs and code lists are listed in the Master Data Register of DG MARE of European Commission[3].

The values mentioned in above tables for the listID attribute refer to a code list alias in the table below. This table maps the code list alias to the code list name in MDR.

Code list alias (ListID in the XSD)
FLUX_MDR_QUERY_TYPE
FLUX_GP_MSG_ID
FLUX_GP_PARTY
FLUX_GP_RESPONSE

FLUX_GP_VALIDATION_LEVEL
FLUX_GP_VALIDATION_TYPE
DATA_TYPE
INDEX
MDM_BR

11. FLUX TL ENVELOPE PARAMETERS

The following FLUX TL parameters must be used.

Common name	FLUX TL Envelope Tag name	Value	Remark
Dataflow name	DF	urn:un:unece:uncefact:fisheries:FLUX:MDM:EU:3	According to format: urn:un:unece:uncefact:fisheries:FLUX:[domain]:[context]:[version]
Timeout DateTime	TODT	Current DateTime (in UTC) + 20 minutes	Value expressed as XSD DateTime in UTC
Acknowledge of Receipt	AR	True	This parameter indicates that FLUX TL will always return an acknowledgement of receipt when the message has been received by the FLUX TL destination node. Note: a non-delivery message is always sent when the recipient cannot be reached, or timeout (TODT) time has been expired.

12. VERSIONING

Version	Author	Date
2.0.4	TR – version in line with BRS	12/01/2016
2.0.5	TR – change format, review services and BRs, add chapter 11	10/11/2016
2.1.0	TR – BR chapter: additional info given in case of a parsing problem, new BRs added	05/04/2017
2.1.1	Update of the description of BR MDM-L00-00-0006	19/09/2019
2.2.0	TR – Suppression of version information from MDR. The main impacts are the suppression of the OBJ_VERSION service, the modification of the OBJ_NEWS service and the adaptation of the data	27/02/2020

	model with the suppression of the Data Set_Version entity.	
2.2.1	TR – -) Description of the OBJ_NEWS service has been improved. An alias of a code list can be now given as parameter. -) The rule L00-00-0009 has been suppressed because related to version numbers that are decommissioned	24/07/2020
3.0.0	TR- -) Ch. 4: new FLUX standard (CCL 21B) for query and return messages -) Ch. 7.2 about return message: Data model modified : the message can contain zero-to-many data sets -) Ch. 11: the dataflow name must be adapted to reflect the major version of this implementation document -) Ch. 13: the contact email has been modified MTU : 15 March 2023	

13. CONTACT

MARE_DATA-MANAGEMENT@ec.europa.eu