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EIE Project

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Service Specification Document/Interface Control Document

Master Data

Functional Location Service – External

External – In the above context is intended to reflect that this content is for Industry partners who have been contracted to participate in an In-Service-Support phase of a Weapon System or Platform that the Department of National Defence has acquired.

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1 Introduction

This document establishes an interface between Canada Electronic Data Exchange (EDE) and ISS Contractor responsible for maintenance of a ship class subject to Performance Based Contracting (PBC). This interface will be used by ISS Contractor to send Functional Location (FLOC) messages to Canada EDE. To support the FLOC transfer between Canada EDE and ISS Contractor, both systems need to support specific Web Service operations as well as request and response Extensible Markup Language (XML) schemas as described in this document. The Functional Location service includes an operation for Canada EDE to report acknowledgement messages back to ISS Contractor.

1.1 Intended Audience

- ISS Contractor System Designers
- Canada EDE Designers
- ISS Contractor Testers
- Canada EDE Testers

1.2 References

All references are to the baseline version of the reference at the time of publication of this document.

[Ref. 1]   Business Process Catalogue Annex P: Navy Canada Maintenance Management System Data Initialization In Support of Performance Based Contracting (PBC);

[Ref. 2]   Electronic Information Exchange Service Interaction Model;

[Ref. 3]   DRMIS Master Data Business Guidelines Air Force ISSCF fleets;

[Ref. 4]   Data Package Service Specification;

[Ref. 5]   BUC 2.2 Exchange Master Data – Inbound.

2   Business Information

Business Information is based on the Electronic Information Environment (EIE) Business Process model for Data Initialization [Ref. 1], the Business Use Case [Ref. 5], and the Defence Resource Management Information System (DRMIS) Master Data Business Guidelines Air Force ISSCF fleets [Ref. 3].

A Materiel Master Record (MMR) identifies all items required to support the weapon system maintenance and supply processes in DND. MMRs include all materiel (spares, consumables, serialized or not, tools, test equipment, etc.) subject to materiel management processes. An MMR is required before the item or part can be referenced or transacted upon in Canada's systems.

Another view of the Weapon System (WS) used in maintenance is the *Functional Location* (FLOC) hierarchy. A functional location refers to a physical part of a WS which is intrinsic to the body of the WS. The Functional Location hierarchy is a parent-child hierarchy. A FLOC may have one or more other FLOCs as its "children" **or** a FLOC may have one or more Equipment Master Records (EMRs) as a child. A FLOC may not have both FLOCs and EMRs as children. A FLOC may have no children.

The goal of the FLOC service is to provide to ISS Contractor a means of sending to Canada the FLOCs for a WS instance and for Canada to acknowledge receipt of the FLOC data or report errors in the data or transmission.

Within Canada, maintenance business processes are supported by two types of information systems, known generically as:

- Canada Maintenance Management System (CMMS)

- Canada Supply System (CSS)

Currently both functions are supported within Canada by the Defense Resource Management Information System (DRMIS).

2.1   Business Processes

The WS supplier is responsible to produce a complete set of MMR data for the ship class. ISS Contractor and Canada engage in a Material Identification Process. This process results in a catalogue of MMRs which are fully indexed and identified by CAGE/MPN, NATO Stock Number (NSN) according to NATO and Industry technical standards.

The WS supplier is also responsible to produce a complete set of FLOC data for each WS instance and definition of FLOCs (if any) for each FLOC.

Prior to each WS delivery the supplier will provide Master Data, including FLOC data, for the configuration of the WS as delivered.

Over the life-cycle of the WS, ISS Contractor may identify new FLOCs and provide these to Canada as part of a new Master Data package.

Master Data must be approved by designated DND staff with the requisite qualifications prior to being used in Production.

2.2 Business Triggers

As per EIE Business Process model for Data Initialization [Ref. 1] the following business events, may result in FLOC data being sent to Canada EDE.

- Prior to delivery of subsequent WS in the ship class;

- The result of an engineering change;

In all cases a direct[1] communication will take place between ISS Contractor and Canada DND to advise Canada DND of the availability of new Master Data. Canada's designated official will, through CMMS, initiate the transfer of the Master Data from Industry[2].

2.3 Master Data Unit of Work

According to PBC, ISS Contractor assumes the responsibility for Configuration Management (CM) of every WS in a ship class. With this responsibility ISS Contractor must be certain of the consistency of Master Data between their source system and CMMS. This is particularly difficult for Master Data as Master Data packages may be very large (i.e., on new WS delivery) and there is a high degree of inter-dependence between Master Data business objects.

To achieve consistency, Master Data business objects are always sent from ISS Contractor to Canada EDE in a single *unit of work.* The unit of work is a logical "package" of Master Data business objects (possibly of more than one type) with a unique identifier. Every individual Master Data message has a reference to its containing unit of work. A unit of work will have a *manifest* which explicitly defines the exchange types and number of **business objects**[3] per exchange type, in the unit of work.

For further discussion on units of work, including retry and error scenarios, please see the EIE Service Interaction Model [Ref. 2].

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[1] Phone, fax, email, but not through Canada EDE services.

[2] Within this document, Industry and ISS Contractor are synonymous and are used interchangeably

[3] When multiple business objects are combined in a single message, the manifest count always applies to the number of business objects irrespective of the number of messages.

The information being provided is to illustrate the model that exists for business processes and information exchange within the Performance Based Contracting (PBC) solution for the Department of National Defence. The information is provided to facilitate an understanding of the business architecture and the solution architecture that exist for the PBC program. The content is not intended to reflect the end state specifications for all of the PBC EIE related services.

3   Business Constraints

Terminology

The input to the service is an *FLOC message* which consists of one or more *FLOC business objects* and metadata (e.g., message header) required for correct message processing between Canada and Industry. [4]

Constraints on Usage of the Service

1) Canada EDE shall ensure every Master Data message is only processed from an Industry which is properly authenticated and authorized to provide Master Data for that ship class.

2) Industry must define a unit of work with a unique identifier prior to sending Master Data; each Master Data message must reference its containing unit of work.

3) The unit of work for Master Data always contains an explicit manifest.

4) Master Data messages will be signed using digital certificates between Canada EDE and Industry. Please see Service Interaction Model [Ref. 2] for details.

Constraints on Behaviour of the Service

5) Canada EDE **does** expect that within a single message there can be more than one Master Data business object - all business objects must be of the same exchange type as defined by the interface and declared in the message header.

6) Canada EDE will report Master Data technical processing errors through the corresponding Error operation of the invoked Master Data service.

7) Canada EDE may attempt to re-send Master Data error messages (i.e., repeat operation invocations) in response to technical errors. This behaviour is controlled by parameters for each operation. Please see Service Interaction Model [Ref. 2] for details.

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[4] FLOC messages are defined in section 7. FLOC business objects are defined in section 6. The message / business subject distinction is used throughout the document.

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4 Service Use Case

The requirements for the FLOC service are defined by one use case with several scenarios.

4.1 Service Context

A high level view of the context of the service is shown in Figure 4-1Figure 4-1 below. For simplicity this view omits error scenarios. These are discussed in Service Use Case Scenarios.
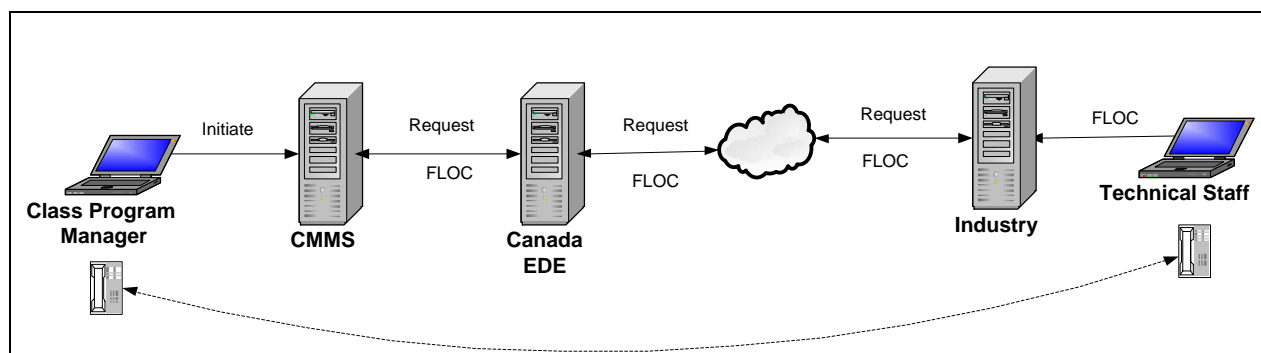

Figure 4-1 FLOC Service Context

The following steps occur:

- Industry Technical Staff create a new Master Data Package including FLOC business objects.

- Industry Technical Staff advises Class Program Manager (or designate) of availability of data package through direct communication.

- Class Program Manager initiates, through CMMS, transfer of the Master Data to Canada.

- Canada EDE forwards initiation request to Industry.

- Industry responds by providing a unit of work declaration message with a manifest that will specify the exchange type and the expected number of business objects for exchange type in the unit of work.

- Canada EDE acknowledges the unit of work message.

- Industry will have to wait for the acknowledgement message from Canada EDE, after which it can begin invoking the appropriate services to initiate the transfer of Master Data business objects.

- Industry begins to send package of Master Data as individual messages, each message contains one or more Master Data business objects (all of the same exchange type).

- For each message received, Canada EDE returns a technical response.

- Canada EDE collects complete package of Master Data.

- Canada EDE dispatches complete Master Data package to CMMS.

- After CMMS processing Class Program Manager accepts or rejects the Master Data package (in its entirety). The result is communicated to Industry.

Once the initiating Master Data request is received by Industry, Industry may send business objects in the Master Data package (FLOC plus any others) in any order. This mode of interaction is termed *Business Asynchronous*.

The "technical response" referred to above either (*i*) confirms a party in the exchange has accepted a message for further processing, or (*ii*) contains a fault message. A technical acceptance does not preclude subsequent "business" errors. Error scenarios are described below.

4.2   Successful Request and Technical Response

This is the main or "Happy Day" scenario. This scenario describes the interaction between Canada EDE and Industry for the FLOC Service. Some validation steps and technical responses are not shown in the following (Figure 4-2Figure 4-2) sequence diagram – full details are in the Service Interaction Model [Ref. 2].
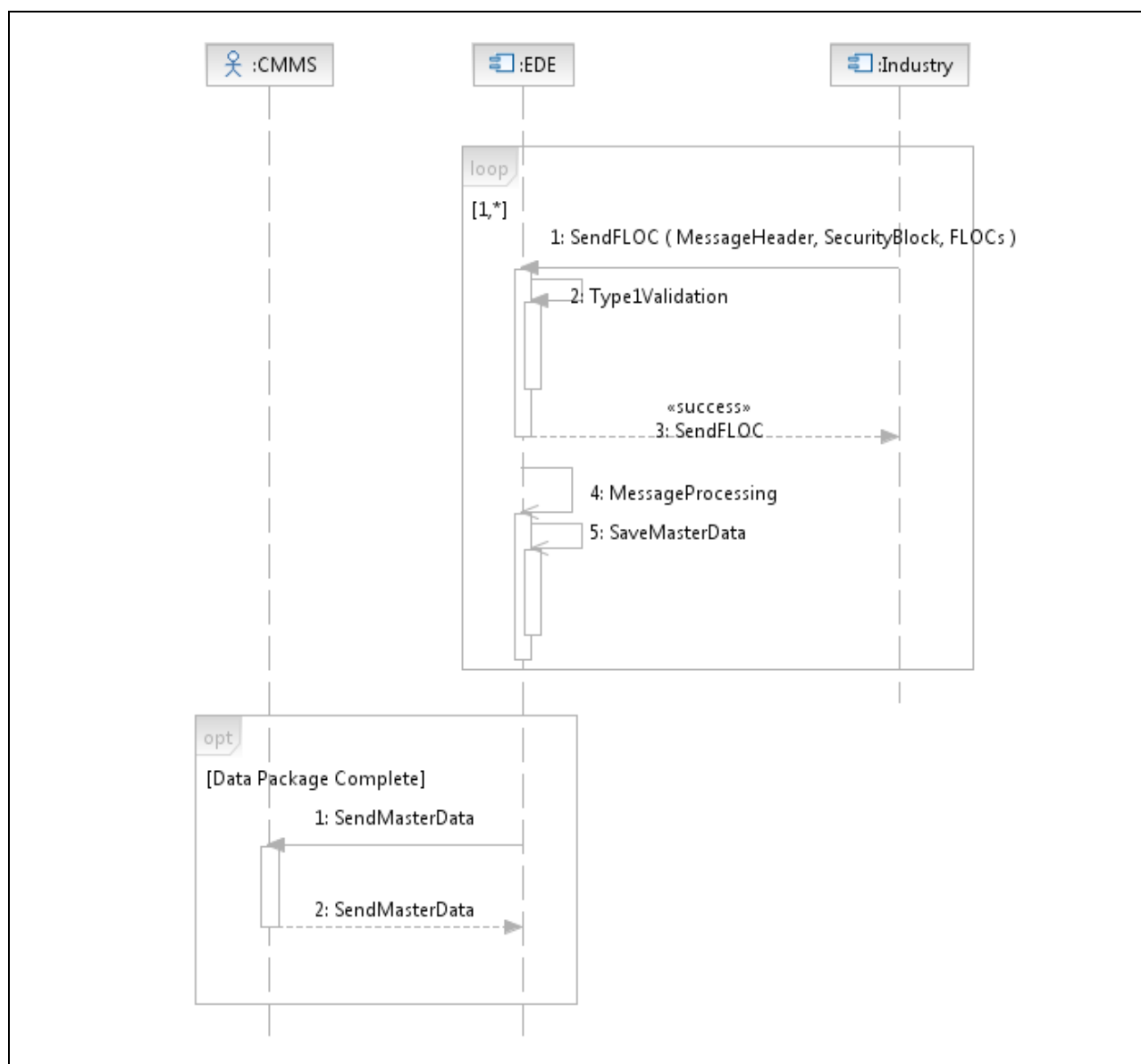
Figure 4-2 FLOC Message Flow

Main Flow	
Scenario	"Happy Day:" Industry successfully sends FLOC business objects to Canada.

Pre-Condition	Industry has prepared a Master Data package containing one or more FLOC business objects.
	Industry Technician has advised DND CPM of the availability of new Master Data.
	DND CPM has initiated request in CMMS.
	Industry has received initiation request and responded with creation of unit of work and manifest.
	Canada has replied to Industry that unit of work is successfully created.
Post-Condition	FLOC business objects successfully received by Canada EDE.
Steps	**Industry begins a loop to send FLOC messages to Canada EDE[5].**
	1) Industry invokes 'SendFLOC()' operation passing UOW ID and one or more FLOC business objects. (See Input Body definition.) Industry waits for technical response.
	2) Canada EDE initiates "Type 1" validation. In this scenario there is no error. Canada EDE accepts "custody" of the FLOC business objects in the message.
	3) Canada EDE returns to Industry a "success" technical response for the SendFLOC() operation. (See Output Body definition.)
	4) Canada EDE begins internal processing of the message. In this scenario there is no error.
	5) Canada EDE saves FLOC business objects to send to CMMS once unit of work is complete.
	Industry continues loop to send more FLOC business objects (if any) to Canada EDE.
	Once Canada EDE has received a complete Master Data package from Industry, Canada EDE will send to CMMS. The details of this process are out of scope of this specification.

Please see Data Package Service Specification [Ref. 4] for the scenario of confirmation from CMMS Master Data has been deployed to operations.

4.3 Alternate Scenarios

The FLOC Message Flow with Type 1 Error sequence diagram is shown in Figure 4-3Figure 4-3. The following scenarios apply to all uses of the FLOC service.

Alternate Scenarios distinguish between "*Type 1*" and "*Type 2*" errors. Type 1 errors are those errors detected prior to the service provider accepting custody of a message. Type 2 errors are those errors detected during internal processing prior to business validation by the target CMMS. Please see Service Interaction Model [Ref. 2] for details on these groupings.

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[5] In practice, FLOC messages may be interleaved with other Master Data messages from the same unit of work, or other units of work.
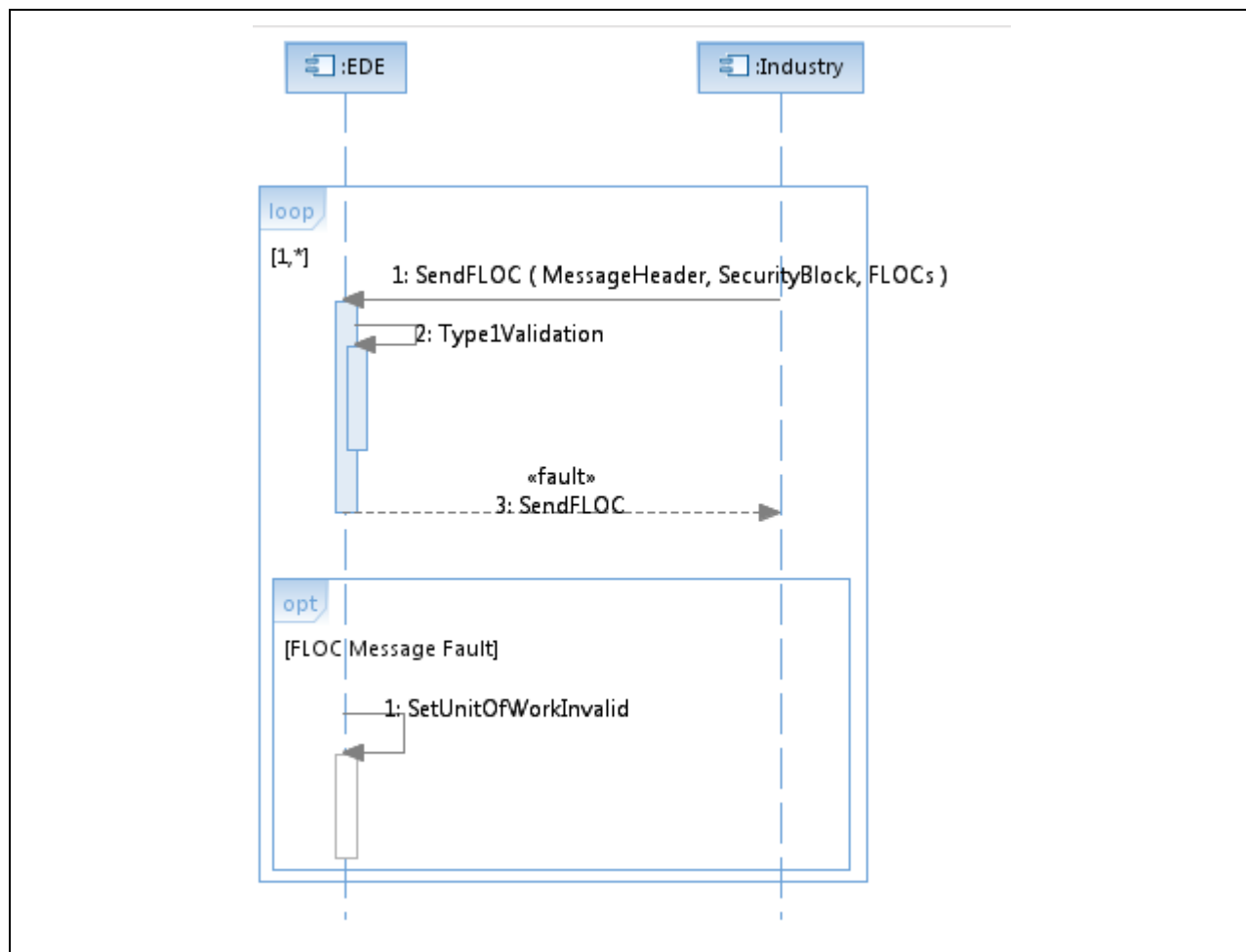
Figure 4-3 FLOC Message Flow with Type 1 Error

Alternate Flow 1	
Scenario	Type 1 Errors detected by Canada EDE prior to accepting custody of the message. Detailed specification of Type 1 errors are in Service Interaction Model [Ref. 2].
Pre-Condition	Same as Main Flow.
Post-Condition	Canada EDE sends technical response containing a fault message (see Service Interaction Model [Ref. 2]) to Industry.
	Industry ceases sending Master Data (of **any** exchange type) for this unit of work.

Steps	1) Industry invokes 'SendFLOC()' operation containing one or more FLOCs.
	2) Canada EDE checks for Type 1 errors – an error is found;
	3) Canada EDE constructs the fault message and sends the fault message to Industry in the technical response to the original SendFLOC() operation invocation. (See Fault Body definition.)
	In the same iteration through the loop where a FLOC Message fault was found:
	1) Canada EDE updates unit of work status to Invalid and deletes the Master Data received so far in the invalid unit of work.

Note that in this scenario (depending on timing factors) Industry may receive additional fault technical responses for other Master Data operations which were invoked for an invalid unit of work.

Alternate Flow 2 (Canada EDE Service unresponsive)	
Scenario	Industry does not receive technical response within ACK_TIME_INTERVAL.
Pre-Condition	Industry has invoked the operation but does not receive the technical response within the time specified for the FLOC service.
Post-Condition	Industry marks the message as Dead Message.
Steps	1) Industry does not receive any response from Canada EDE within the allowed ACK_TIME_INTERVAL.
	2) Industry will retry sending the message up to the defined maximum retry count and/or Time to Live interval.
	3) If there is no response, then Industry marks the request message as Dead and handles it via the Dead Message protocol (See Service Interaction Model [Ref. 2].
Alternate Flow 3 (CMMS Business Error)	
Scenario	CMMS reports a business error when attempting to load one or more Master Data business objects.
Pre-Condition	All business objects have been received by CMMS, and CMMS starts its data load process. Canada CMMS sends TPMS message to Canada EDE.
Post-Condition	Canada EDE sends technical problem through TPMS interface to Industry.
Steps	1) Canada EDE invokes Industry TPMS operation and receives a positive technical response.

5 Service Description – Functional Location Service

5.1 Service Overview

Functional Location service requires interacting web services exposed by Canada EDE System and Industry. Canada EDE will implement and expose a service and operation which Industry will use to send the FLOC input message (see Section 7 for message definition). After receipt of the input message, Canada EDE will return a technical response back to Industry.

As part of the Functional Location service Industry will implement and expose two operations:

- An error reporting operation optionally used by Canada EDE to report business errors[6];

- An acknowledgement service optionally[7] used by Canada EDE to report successful delivery of FLOC business objects to CMMS.

Message interaction is further described in Service Interaction Model [Ref. 2].

5.2 Service Properties

Service Property	Description
Enterprise Service Name (Business)	Functional Location Service
Enterprise Service Name (Technical)	FunctionLocationService (Abbreviated in this document to FLOC service.)
Purpose	This service supports the Canada EDE Master Data. On the occurrence of business triggers, Industry uses this service to send FLOC messages to Canada EDE.
Business Response Time Interval	Will be determined between Canada and Industry on a per-ship class basis.
Service Domain	Master Data
Business Owner	ADM (IM)
Service Grouping	Master Data
Source Provider	SendFLOC() - Canada EDE SendFLOCAck() – Industry SendFLOCError() - Industry

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[6] Use of business errors is determined between Canada and Industry on a per-class basis.

[7] Use of this positive acknowledgement is determined between Canada and Industry on a per shipper ship class basis.

Service Property	Description
Target Service Consumers	SendFLOC() - Industry SendFLOCAck() – Canada EDE SendFLOCError() – Canada EDE
Business Process Supported (now)	Master Data processes: • Initial Data Load; • Engineering Change;
Business Process Supported (future)	None currently identified.
Business Objective Supported	See Section 2: Business Information.
Expected life time	The full lifecycle of the subject weapons system.

5.3 'SendFLOC()' Operation

This operation is used by Industry to send an FLOC input message to Canada EDE. Canada EDE's implementation of this operation will perform Type 1 validation on the FLOC message. Canada EDE will return a status or fault information to Industry in a technical response. If the status is "**success**", Canada EDE accepts custody of the message for further processing. Any returned fault implies Canada EDE does NOT accept the message and error processing (as per Section 4.3 Alternate Flow 1) is performed.

5.4 'SendFLOCAck()' Operation[8]

This operation is used by Canada EDE to report back to Industry that a set of FLOC business objects have been accepted into CMMS. The specific FLOC business objects which were accepted are identified by a list of business identifiers (see Section 7). Industry's implementation of this operation will perform Type 1 validation on the acknowledgement message. Industry will return a technical response to Canada EDE.

This operation may be optionally used with an Industry which does not operate on an optimistic model as defined in the Service Interaction Model [Ref. 2].

5.5 'SendFLOCError()' Operation[9]

This operation is used by Canada EDE to send an error message to Industry after internal message processing detects a Type 2 error condition (see Service Interaction Model [Ref. 2]). The specific FLOC business objects which are in error are identified by a list of business identifiers (see Section 7).

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[8] Use of this positive acknowledgement is determined between Canada and Industry on a per-class basis.

[9] Use of business errors is determined between Canada and Industry on a per-class basis.

Industry's implementation of this operation will perform Type 1 validation on the error message. Industry will return a technical response to Canada EDE.

Further processing of FLOC messages is terminated regardless of Industry's response to the 'SendFLOCError() ' invocation.

6 Information Model

This section describes the **business objects** which are used in the FLOC service. The Unified Modeling Language (UML) notation is used. A underlined functional view[10] of the information model is provided in the Master Data Business Guidelines [Ref. 3] and the Business Use Case [Ref. 5].

The purpose of this section is to provide a bridge between the functional view of the information model and the concrete details of the design as ultimately expressed in an XML Schema.

Note that all date or time values must be in **Coordinated Universal Time (UTC).** If an explicit time zone offset is not provided it is assumed to be zero.

The XML Schema is the authoritative source for purpose of the information exchange.

6.1 FLOC

A Functional Location business object is used to describe measured quantities which are used in maintenance of the WS.

Figure 6-1Figure 6-1 shows the Information Model used in the Functional Location service. In the following _underlined italic_ text refers to specific classes in Figure 6-1Figure 6-1.

The class _FunctionalLocation_ represents the Functional Location. The FLOC_Id field provides a unique name for each FLOC[11].The Desc field is a description, in a common nomenclature, of the FLOC. There may be one or two Desc and different languages may be used[12] as indicated by the <<lang>> stereotype.

The class _FunctionalLocation_ contains an optional instance of _MMR_ID_ pointing to the MMR of the BOM header. The StructureElementIndicator field indicates a BOM.

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[10] The Functional View details the collection of fields which make up FLOC business objects.

[11] A naming convention is defined for each ship class.

[12] The language(s) to be used are determined between DND and Industry. Language tags are based on www.w3.org standards.
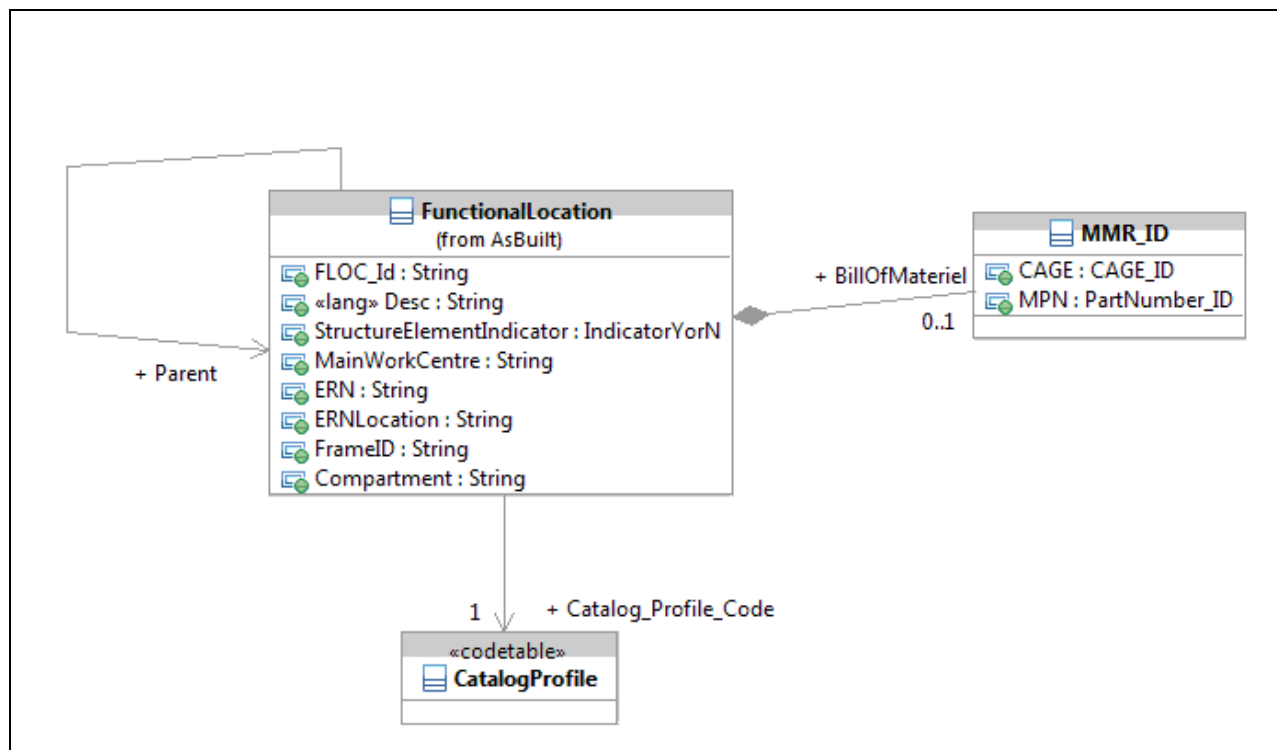

Figure 6-1 Information Model – Functional Location

6.2   As Built Structure

The Functional Location is part of the WS "As Built" structure. An overview of "As Built" is shown in Figure 6-2Figure 6-2 below, each business object is described in one of the Service Specification documents.
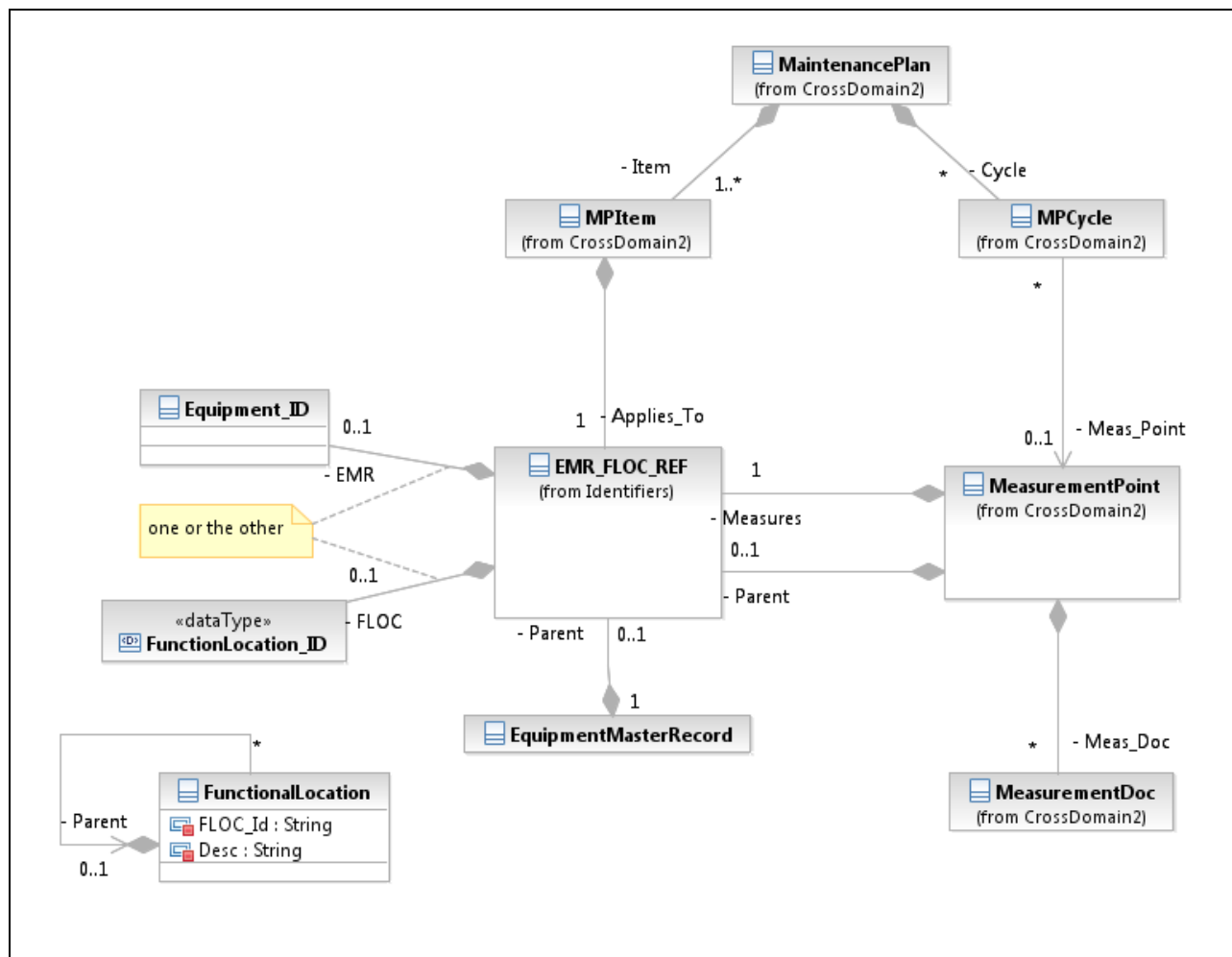
Figure 6-2 Information Model – As Built Structure

Note that _EMR_FLOC_REF_ is class which encapsulates a reference to **either** a CAGE/MPN/SerialNumber combination **or** a FLOC identifier. It is used in cases where a business object may have a link to either an EMR or a FLOC.

7 Operation Message Model

This section describes how the business objects described above (Section 6 Information Model) are aggregated for the purpose of PBC information exchange.

All Master Data services follow the request/response model and each operation definition includes a distinct input, output and fault message. See Service Interaction Model [Ref. 2] for definition of the common MessageHeader and SecurityClassification elements. BusinessContext allows Industry to include contextual information with an input message. The 'Purpose' field is a value agreed between Canada EDE and Industry and may affect handling of the message. The remaining fields are populated by Industry and may be replayed in error messages[13].

Several message constructs (i.e., Fault Body, Acknowledgement Input Body and Error Input Body) include one or more **Business Identifiers** (BizIDs). The BizID consists of a set of key fields in the FLOC Input Body sufficient to uniquely identify a business object and its context. The fields which make up the BizID are explicitly identified in the XML Schema file FunctionalLocation.xsd.

Note that all date or time values must be in **Coordinated Universal Time (UTC).** If an explicit time zone offset is not provided it is assumed to be zero.

7.1 FLOC Input Body

As shown in Figure 7-1Figure 7 1, a FLOC input body consists of:

- A Message Header;
- A Security Block;
- A Business Context;
- One or more FLOC business objects.

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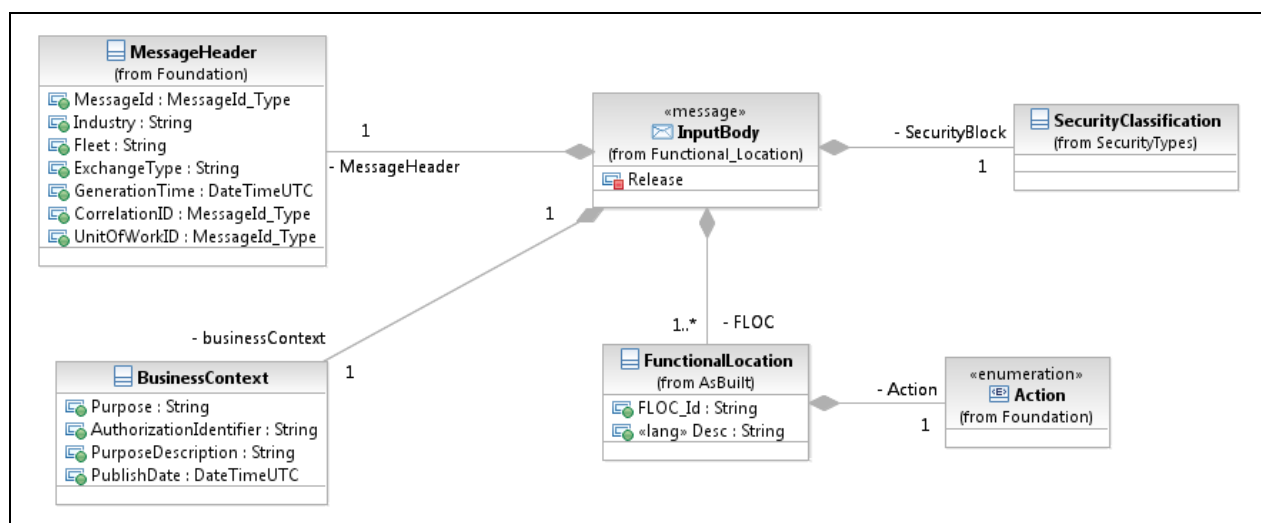
[13] Business Context is further discussed in the Unit of Work service specification.

Figure 7-1 FLOC Input Body

The MessageHeader UnitofWorkID must equal the UnitofWorkID value of an existing valid unit of work.[14] The MessageHeader CorrelationID must equal the MessageId of the UnitofWork message. Purpose and ContextDescription fields must match the corresponding fields in the Unit of Work which envelopes this input message.

The FLOC InputBody also contains an attribute 'Release' which designates the release of the FLOC service. The 'Release' attribute uses an "X.Y" numbering convention and the value is hard-coded in the XML schema for every service. The value will be incremented when a new version of the service is released[15].

The 'Release' attribute is mandatory in every instance of the InputBody to allow any input body instance to be traced back to the appropriate release. A 'Release' attribute appears in all message bodies.

Within each Functional Location business objects there is an attribute named 'Action' which is set by the service consumer as a directive to CMMS on handling the business object. See Service Interaction Model [Ref. 2] for definition of valid values of 'Action'.

7.2   FLOC Output Body

The output of the SendFLOC() operation is the FLOC OutputBody. As shown in Figure 7-2Figure 7-2, the output body consists of:

- A Message Header;
- A Custody object.

The FLOC OutputBody has no security block. The FLOC OutputBody must not contain any sensitive or protected information.
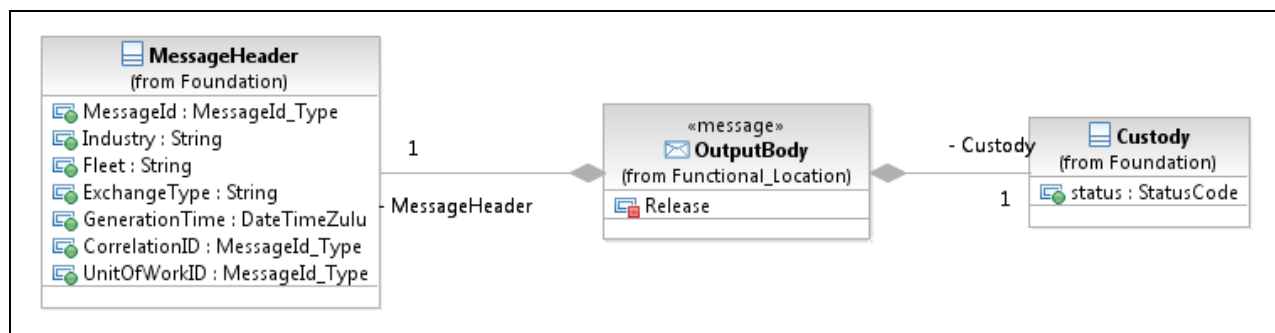

Figure 7-2 FLOC Output Body

For a FLOC OutputBody:

- The MessageHeader Message Id is a **new** unique value;

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[14] Type 1 validation will check if the unit of work is in a non-error state.

[15] The rules for incrementing the 'Release' attribute for a service will be in a separate document.

- The MessageHeader GenerationTime is the time the **output** message is generated;

- The MessageHeader CorrelationID is set to the MessageId of the FLOC Input Body;

- The MessageHeader ExchangeType must be set to the ExchangeType of the FLOC InputBody;

- The value of the Custody status field is "success".

7.3 FLOC Fault Body

A fault returned by the SendFLOC() operation uses the FLOC FaultBody element. As shown in Figure 7-3~~Figure 7-3~~, the FLOC FaultBody consists of:

- A Message Header;

- A Security Block;

- One or more FaultBlocks.

Each fault block pertains to zero to many business objects, to the level of granularity which the Service Provider can provide. If the system cannot determine a Business Identifier then this is omitted. To report differing faults on more than one business object, extra fault blocks can be included in the fault message.
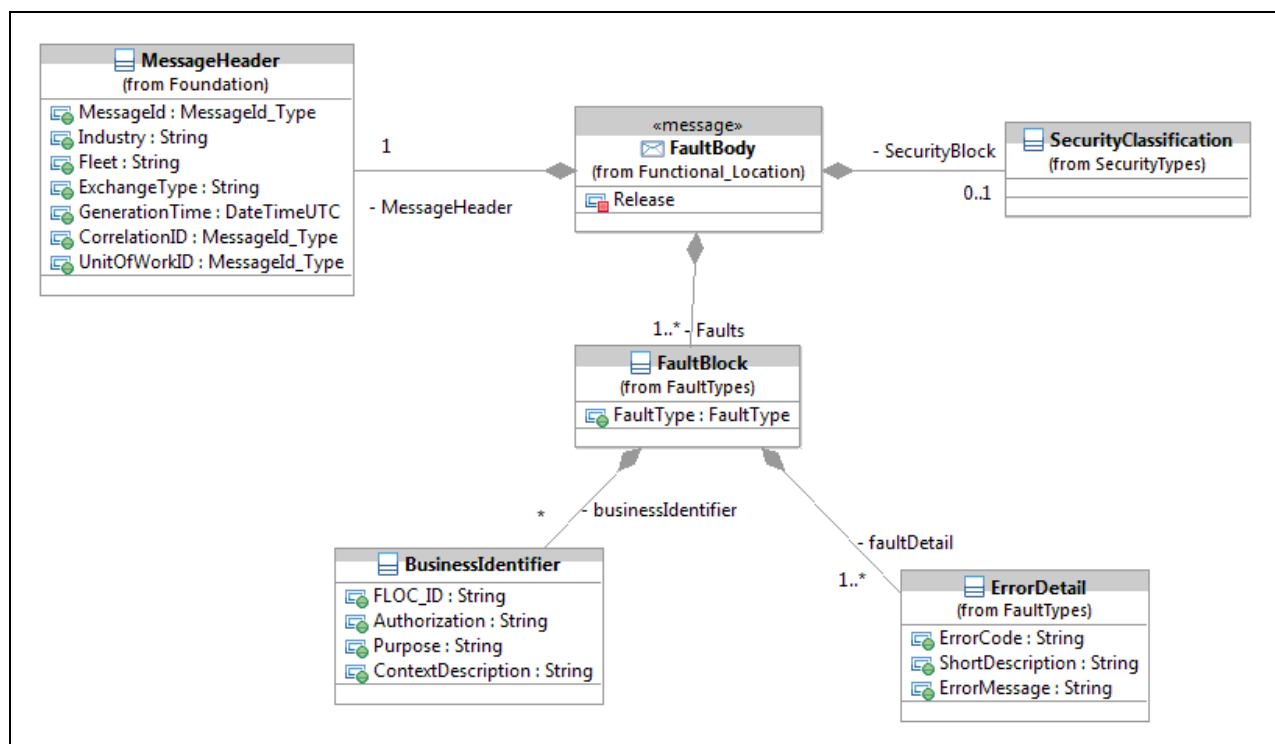

Figure 7-3 FLOC Fault Body

MessageHeader is mandatory, but only MessageID and GenerationTime are mandatory within the header (both are new values, as for the Output Body). This is for the scenario where the input message is so damaged that the necessary attributes cannot be found.

CorrelationID is set to the MessageId of the input message – whenever it is available.

SecurityClassification is optional for the scenario where the input message is so damaged that the necessary attributes cannot be determined.

7.4   FLOC Acknowledgement Input Body

The input to the SendFLOCAck() operation consists of a Message Header, a list of business identifiers, and a "success" status indicating the business objects were accepted in CMMS.
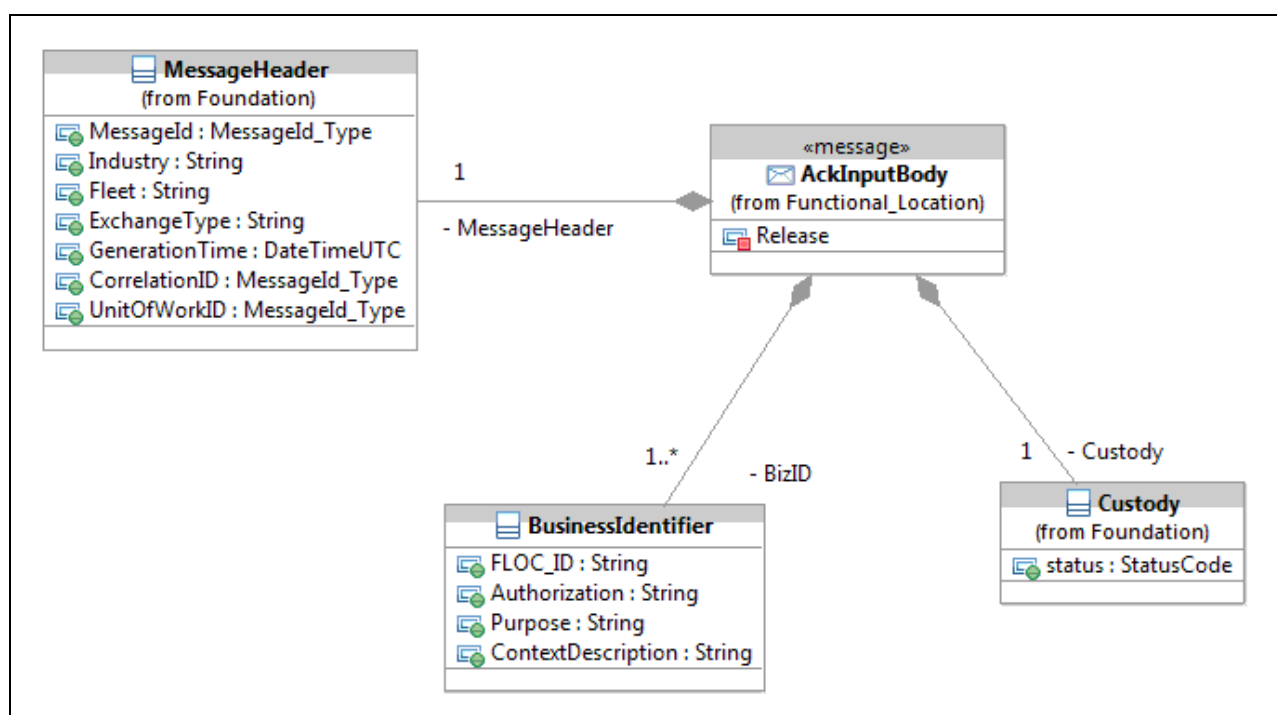

Figure 7-4 FLOC Acknowledgement Input Body

The Message Header has a new unique Message Id and the CorrelationID is set to the MessageId of the FLOC InputBody which is being acknowledged.

7.5   FLOC Error Input Body

The input to the SendFLOCError() operation consists of a Message Header, a Security Block and a list of Error Blocks, as shown in Figure 7-5Figure 7-5. Each Error Block references business object(s) (by business identifier) and a list of one or more errors pertaining to the business object.
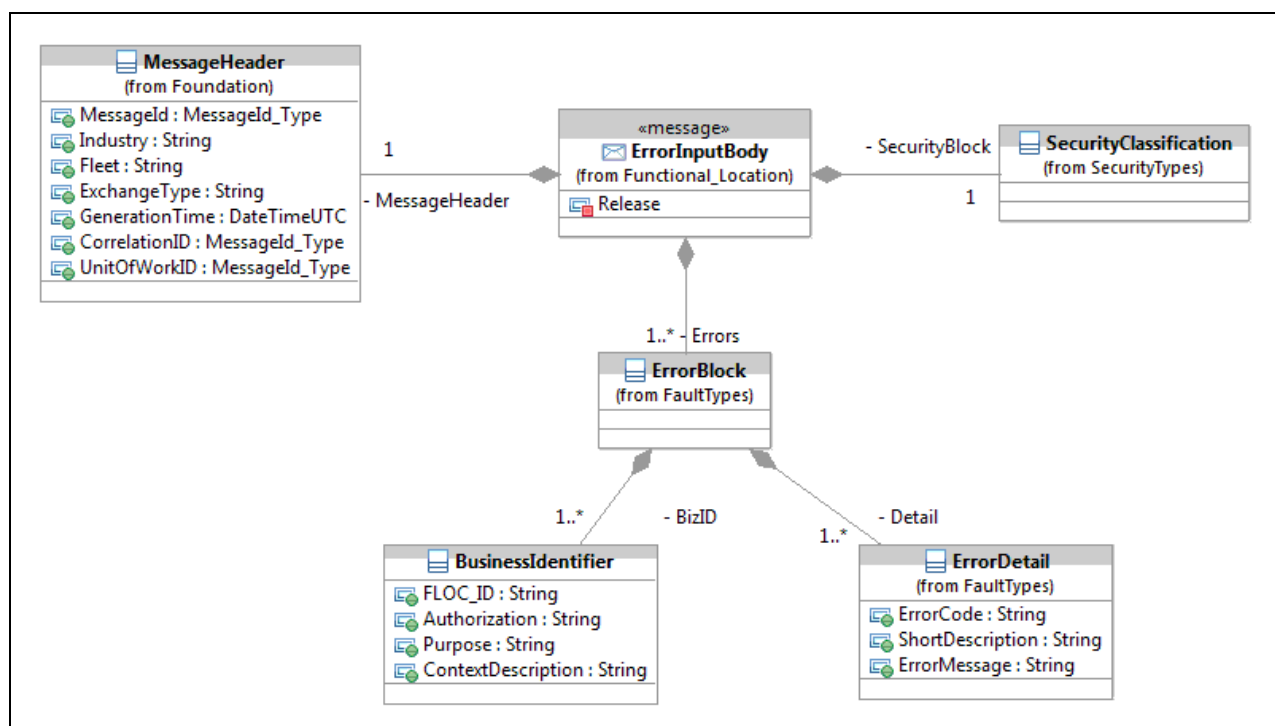
Figure 7-5 FLOC Error Input Body

MessageHeader and SecurityClassification are mandatory as in this scenario (after Type 1 validation has passed) the input message is well-formed.

The MessageHeader has a new unique MessageId.

If the error is a Type 2 error detected by Canada EDE then the CorrelationID and UnitOfWorkID are set based on the Message Header of the FLOC Input Body for which the errors are being reported.

If the error is a Business error from CMMS then the CorrelationID and UnitOfWorkID are omitted.

7.6   Summary of Operation to input/output/fault body Mapping

The following diagram in Figure 7-6Figure 7-6 shows the mapping for each of the three operations in the FLOC service - SendFLOC(), SendFLOCAck() and SendFLOCError() - to their respective input, output and fault bodies as further defined in the FLOC Web Service Definition Language (WSDL) file.
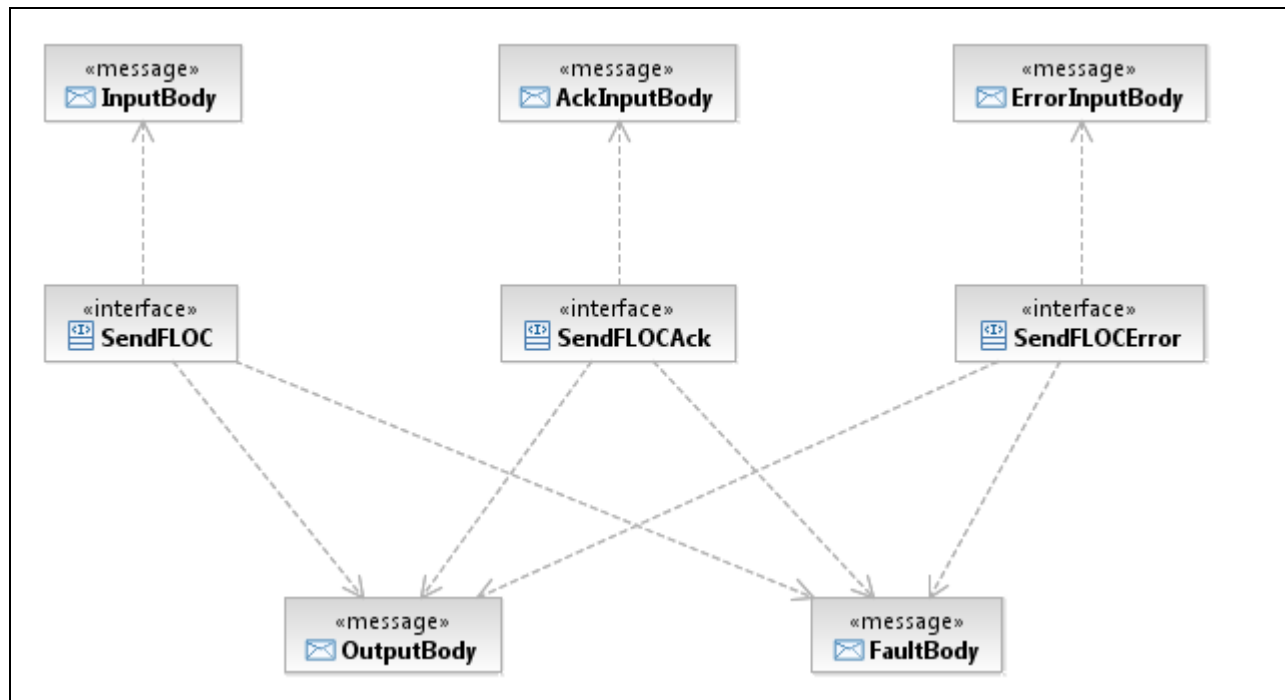
Figure 7-6 FLOC Operations to Input/Output/Fault Mapping

8 Service Operation Details

8.1 Detailed Operation Characteristics – SendFLOC()

Industry will invoke the exposed Canada EDE FLOC service through this operation. The input will consist of a FLOC InputBody (as above).

Please refer to Service Interaction Model [Ref. 2] for definitions of the terminology used in the non-functional requirements section.

Please refer to FLOC WSDL files for implementation details.

Detailed Operation Characteristics

Interface Definition	Description
Operation Name	Send FLOC
Operation Technical Name	SendFLOC()
Operation Description	This operation is invoked by Industry to send one or more FLOC business objects to Canada EDE.
Target Operation Provider	Canada EDE
Target Operation Consumer	Industry
Properties	*Request/Response* message exchange pattern.
Input Message Definition	Please refer to Operation Message Model Section 7.1 FLOC Input Body for details.
Output Message Definition	Please refer to Operation Message Model Section 7.2 FLOC Output Body for details.
Fault Definition	Please refer to Section 7.3 FLOC Fault Body for details. Please see Service Interaction Model [Ref. 2] for Type 1 faults.

Non-Functional Requirements

Non-Functional Requirements/Technical Details	
Frequency	A-periodic according to business triggers (Section 2.2). Will be determined between Canada and Industry on a per-ship class basis.
Peak Throughput Time	Based on Service Level Agreements (SLA) to be determined between Canada and Industry on a per-ship class basis.
Peak Throughput Volume	Based on Service Level Agreements (SLA) to be determined between Canada and Industry on a per-ship class basis.

Non-Functional Requirements/Technical Details	
Payload Size	<1Kb per business object
Attachments	None
Attachment Size	N/A
ACK Time Interval	Nominal value is 2 minutes – to be confirmed between Canada and Industry on a per ship class basis.
Retry Time Interval	Nominal value is 10 minutes – to be confirmed between Canada and Industry on a per ship class basis.
Number of Retries	Nominal value is 3 retries – to be confirmed between Canada and Industry on a per ship class basis.
Biz. Response Time Interval	N/A
Time to Live Span	24 hours from the creation of the unit of work.
Service Op Availability	During core processing hours. The specific period will be defined during later phases of service realization 95% available uptime is the goal of the service
Downtime Requirements	The service cannot be used during established maintenance windows, which is currently expected to be for about 2 hours per week. The unavailability window may be accumulated and invoked during major maintenance periods, but ensuring that the overall availability of the service is still maintained.
Dead Message Handling	Alternative communication channel applies to report that this operation is not available when Industry cannot successfully send FLOC business objects to Canada EDE. See Service Interaction Model [Ref. 2].

8.2 Detailed Operation Characteristics – SendFLOCError()

Canada EDE will use this operation to inform Industry of errors detected in internal processing and faults returned from delivery to CMMS.[16]

Refer to FLOC WSDL files for implementation details.

Detailed Operation Characteristics

Interface Definition	Description
Operation Name	Send FLOC Error

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[16] Use of business errors is determined between Canada and Industry on a per-class basis.

Interface Definition	Description
Operation Technical Name	SendFLOCError()
Operation Description	This operation is invoked by Canada EDE to send one or more FLOC errors to Industry.
Target Operation Provider	Industry
Target Operation Consumer	Canada EDE
Properties	*Request/Response* message exchange pattern.
Input Message Definition	Please refer to Operation Message Model Section 7.5 FLOC Error Input Body for details. Please refer to Service Interaction Model [Ref. 2] for Type 2 faults for the error inputs which may be sent in this operation.
Output Message Definition	Please refer to Operation Message Model Section 7.2 FLOC Output Body for details.
Fault Definition	Please refer to Section 7.3 FLOC Fault Body for details Please see Service Interaction Model [Ref. 2] for faults which may be returned by this operation.

Non-Functional Requirements

Non-Functional Requirements/Technical Details	
Frequency	Same as SendFLOC() operation. Worst case is one error per FLOC business object.
Peak Throughput Time	Same as SendFLOC() operation.
Peak Throughput Volume	Same as SendFLOC() operation.
Payload Size	5KB – estimated for one ErrorBlock with one BizID and two ErrorMessage's
Attachments	None
Attachment Size	N/A
ACK Time Interval	Nominal value is 2 minutes – to be confirmed between Canada and Industry on a per ship class basis.
Retry Time Interval	Nominal value is 10 minutes – to be confirmed between Canada and Industry on a per ship class basis.
Number of Retries	Nominal value is 3 retries – to be confirmed between Canada and Industry on a per ship class basis.

Non-Functional Requirements/Technical Details	
Biz. Response Time Interval	N/A
Time to Live Span	60 minutes.
Service Op Availability	During core processing hours. The specific period will be defined during later phases of service realization 95% available uptime is the goal of the service
Downtime Requirements	The service cannot be used during established maintenance windows, which is currently expected to be for about 2 hours per week. The unavailability window may be accumulated and invoked during major maintenance periods, but ensuring that the overall availability of the service is still maintained.
Dead Message Handling	Alternative communication channel applies to report that this operation is not available when Industry cannot successfully send FLOC business objects to Canada EDE. See Service Interaction Model [Ref. 2].

8.3   Detailed Operation Characteristics – SendFLOCAck()[17]

Canada EDE *may* use this operation to inform Industry of successful delivery of business objects to CMMS. Usage of this operation is to be confirmed between Canada and Industry on a per-ship class basis.

Refer to FLOC WSDL files for implementation details.

Detailed Operation Characteristics

Interface Definition	Description
Operation Name	Send FLOC Acknowledgement
Operation Technical Name	SendFLOCAck()
Operation Description	This operation is invoked by Canada EDE to send one or more FLOC acknowledgement objects to Industry.
Target Operation Provider	Industry
Target Operation Consumer	Canada EDE
Properties	*Request/Response* message exchange pattern.

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[17] Use of this positive acknowledgement is determined between Canada and Industry on a per ship class basis.

Interface Definition	Description
Input Message Definition	Please refer to Operation Message Model Section 7.4 FLOC Ack Input Body for details.
Output Message Definition	Please refer to Operation Message Model Section 7.2 FLOC Output Body for details.
Fault Definition	Please refer to Section 7.3 FLOC Fault Body for details. Please see Service Interaction Model [Ref. 2] for faults which may be returned by this operation.

Non-Functional Requirements

Non-Functional Requirements/Technical Details	
Frequency	To be confirmed between Canada and Industry on a per ship class basis. Depends on pace of back-end processing.
Peak Throughput Time	To be confirmed between Canada and Industry on a per ship class basis. Depends on pace of back-end processing.
Peak Throughput Volume	To be confirmed between Canada and Industry on a per ship class basis. Depends on pace of back-end processing.
Payload Size	~ 1KB per acknowledgement
Attachments	None
Attachment Size	N / A
ACK Time Interval	Nominal value is 2 minutes – to be confirmed between Canada and Industry on a per-ship class basis.
Retry Time Interval	Nominal value is 10 minutes – to be confirmed between Canada and Industry on a per-ship class basis.
Number of Retries	Nominal value is 3 retries – to be confirmed between Canada and Industry on a per ship class basis.
Biz. Response Time Interval	N/A
Time to Live Span	60 minutes.

Non-Functional Requirements/Technical Details	
Service Op Availability	During core processing hours. The specific period will be defined during later phases of service realization 95% available uptime is the goal of the service
Downtime Requirements	The service cannot be used during established maintenance windows, which is currently expected to be for about 2 hours per week. The unavailability window may be accumulated and invoked during major maintenance periods, but ensuring that the overall availability of the service is still maintained.
Dead Message Handling	Alternative communication channel applies to report that this operation is not available when Industry cannot successfully send FLOC business objects to Canada EDE. See Service Interaction Model [Ref. 2].

8.4   Service Bindings

8.4.1   SOAP Over http

The implementation of this service will use a Simple Object Access Protocol (SOAP) binding with document style messages and http transport.

The business objects (Section 6) are bound to the SOAP Body element. The SOAP Header is used for EIE adopted WS-* standards-based elements (e.g., WS_Security assertions) and, typically, MessageHeader and SecurityMarkings elements.

In this binding the http response is used for each operation's technical response (i.e., output or fault messages).

See the Functional Location Service WSDL file for the precise binding.

8.4.2   SOAP Over JMS

Not currently supported.

9 Definitions, Acronyms, Abbreviations

Term	Description
CM	Configuration Management
CMMS	Canada Maintenance Management System
CMP	Class Program Manager
CSS	Canada Supply System
DND	Department of National Defence
DRMIS	Defense Resource Management Information System
Canada EDE	Electronic Data Exchange
EIE	Electronic Information Environment
EMR	Equipment Master Record
FLOC	Functional LOCation
ISS	In Service Support
ISSCF	In Service Support Contracting Framework
MER	Master Equipment Record
MPN	Manufacturer Part Number
MMR	Materiel Master Record
NATO	North Atlantic Treaty Organization
NSN	NATO Stock Number
PBC	Performance Based Contracting
SOAP	Simple Object Access Protocol
UTC	Coordinated Universal Time
WS	Weapon System
WSDL	Web Service Definition Language
XML	Extensible Markup Language

10 Appendix A - Entity Relationship Model

Information Model – Entity-Relationship View

The information being provided is to illustrate the model that exists for business processes and information exchange within the Performance Based Contracting (PBC) solution for the Department of National Defence. The information is provided to facilitate an understanding of the business architecture and the solution architecture that exist for the PBC program. The content is not intended to reflect the end state specifications for all of the PBC EIE related services.
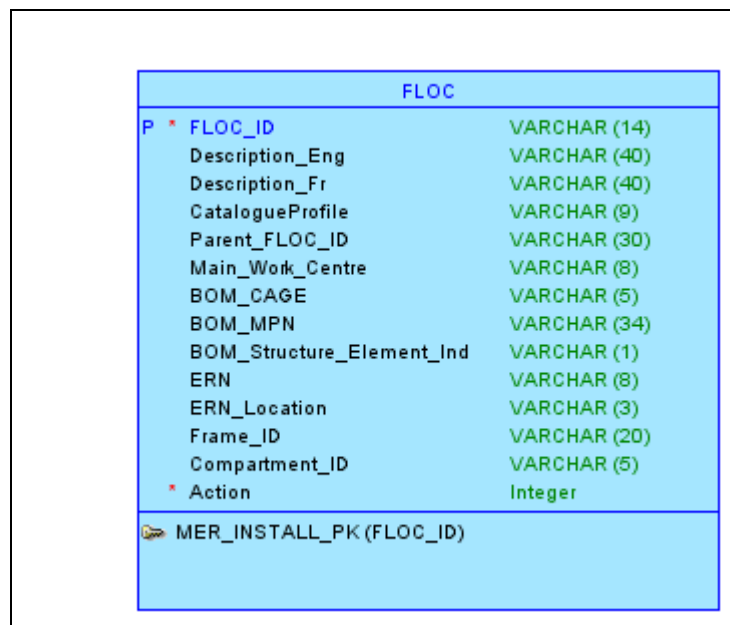
Figure 10-1 FLOC ERD

11   Document History

Revision Number	Description	Date
1.0	Ready for Navy RFP	24 October 2015