Electronic Information Environment (EIE)

Service Specification Document/Interface Control Document

Master Data

Navy Industry Form-Fit-Function Class 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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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.

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1 Introduction

This document establishes an interface between Canada Electronic Data Exchange (EDE) system and the ISS Contractor responsible for maintenance of a ship class subject to Performance Based Contracting (PBC) This interface will be used by Canada to send Form-Fit-Function Class (FFFC) messages to Industry. To support the FFFC transfer between Canada EDE and the 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 Form-Fit-Function Class service includes an operation for the ISS Contractor to report acknowledgement messages back to Canada.

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 2.1 Exchange Master Data – Outbound;

[Ref. 6] Master Data Initialization for Industry/ISSC Service Operational Model.

2 Business Information

Business Information is based on the EIE Business Process model for Data Initialization [Ref. 1], the Business Use Case [Ref. 5], and the 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. For PBC managed weapon systems, materiel is always identified by the combination of the manufacturer CAGE code and the Manufacturer Part Number (MPN). For example, all materiel related supply processes, e.g. demands and receipts are executed using the CAGE/MPN combination. MMRs are considered part of "As-Designed" data and apply to the ship class as a whole, not just individual Weapon System (WS) instances.

When the ISS Contractor supplies parts to Canada there may be cases where two (or more) parts (each with an MMR) are allowable substitutes. In other words, Canada may demand a part by MMR (for a Work Order) but the ISS Contractor may supply a substitute with a different MMR. The Form-Fit-Function Class is the Master Data structure which defines allowable substitutes.

FFFCs are considered part of "As-Designed" data and apply to the ship class as a whole, not just individual Weapon System (WS) instances.

The goal of the FFFC service is to provide a means for Canada to send to the ISS Contractor the FFFCs for a ship class and for the ISS Contractorto acknowledge receipt of the FFFC 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

For some PBC contracts, the WS supplier is responsible to produce a complete set of master data for each ship class. The initial LSAR data set for the ship is provided to Canada by the shipbuilder and will be the basis for the initial data load into CMMS. Canada will provide CMMS master data associated with platform, including FFFc data, to the ISS Contractor through the EDE.

See [Ref. 1] for further details.

2.2 Business Triggers

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

- The ISS Contractor initiates a Master Data demand request for a ship;

For Master Data a direct[2] communication will take place between the ISS Contractor and Canada DND to advise Industry of the availability of new Master Data. The ISS Contractor will, through Canada EDE, initiate the request for transfer of the Master Data to the ISS Contractor.

2.3 Master Data Unit of Work

According to PBC, the ISS Contractor assumes the responsibility for Configuration Management (CM) of every WS in a class. With this responsibility Industry 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 Canada to Industry 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] and Master Data Operational Model [Ref. 6].

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

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

[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.

3 Business Constraints

Terminology

The input to the service is an ***FFFC message*** which consists of one or more ***FFFC 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) The Industry FFFC service shall only be invoked by the Canada EDE System.
2) Canada DND systems shall ensure the FFFC data for a WS is sent only to the Industry system which is properly authenticated and authorized to see maintenance and materiel data for that ship class.
3) Canada 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.
4) The unit of work for Master Data always contains an explicit manifest.
5) 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

6) 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.
7) Industry will authorize invocations of operations of the FFFC service.
8) Canada EDE may attempt to re-send Master Data 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.

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

4 Service Use Case

The requirements for the FFFC 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 4-1 below. For simplicity this view omits error scenarios. These are discussed in Service Use Case Scenarios.

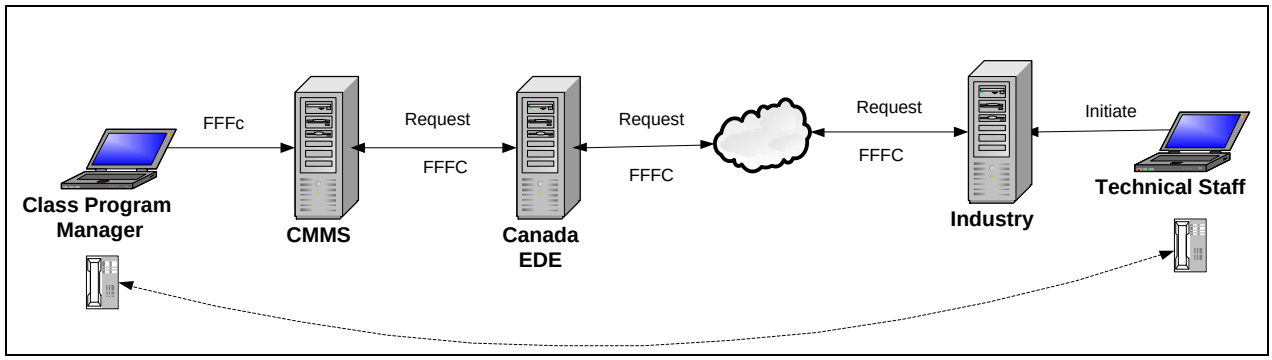

Figure 4-1 FFFC Service Context

The following steps occur:

- Class Program Manager create a new Master Data Package including FFFC business objects.
- Class Program Manager advises Industry of availability of data package through direct communication.
- Industry initiates, through EDE, data request for transfer of the Master Data from Canada.
- Canada EDE 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.
- Industry acknowledges the unit of work message.
- Canada EDE will have to wait for the acknowledgement message from Industry, after which it can begin invoking the appropriate services to initiate the transfer of Master Data business objects.
- Canada EDE 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, Industry returns a technical response.
- Industry collects complete package of Master Data.
- After Industry processing, Industry accepts or rejects the Master Data package (in its entirety). The result is communicated to CMMS via Canada EDE.

Once the initiating Master Data request is received by Canada, Canada may send business objects in the Master Data package (FFFC 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 FFFC Service. Some validation steps and technical responses are not shown in the following sequence diagram (Figure 4-2) – full details are in the Service Interaction Model [Ref. 2].

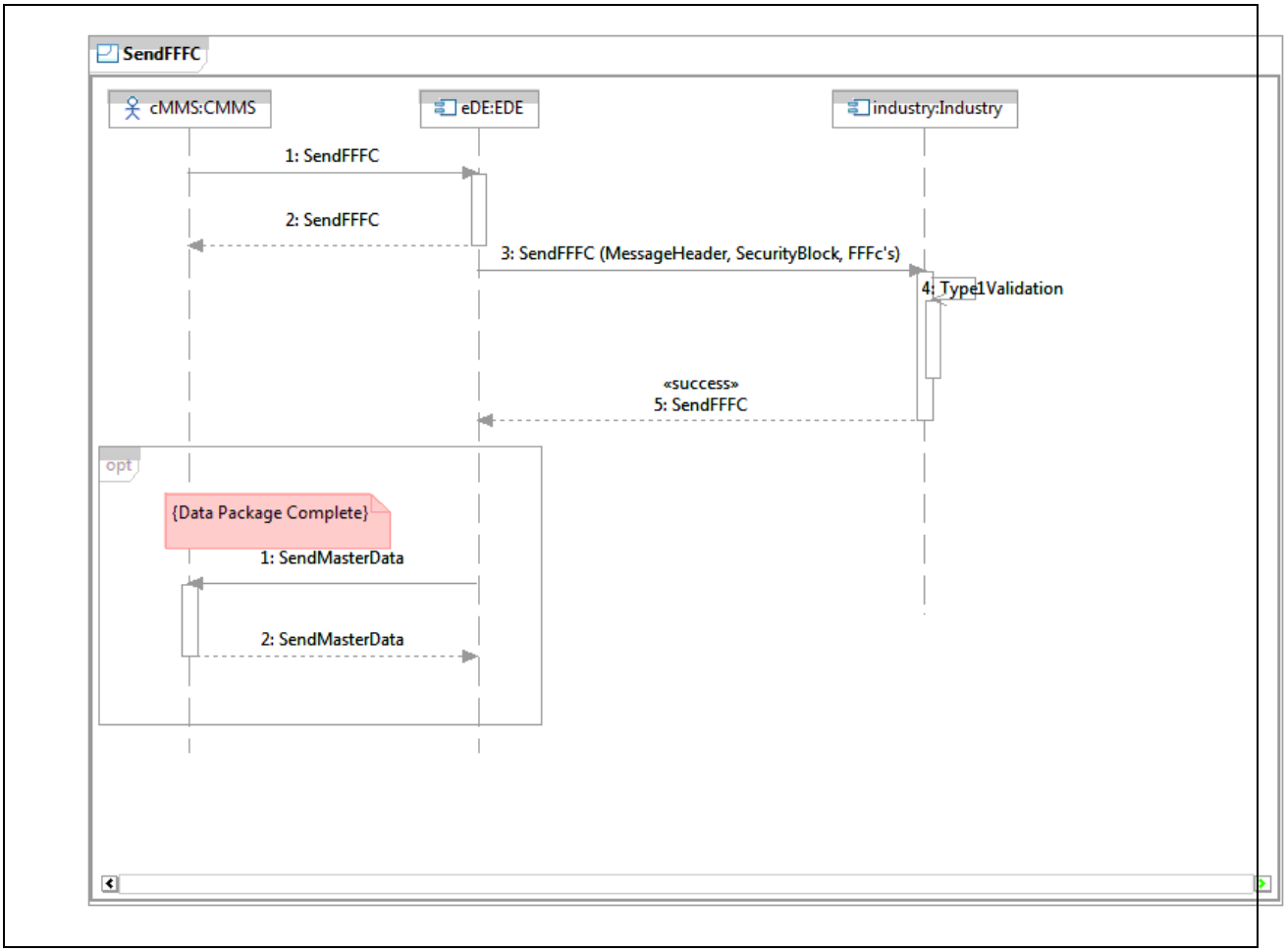

Figure 4-2 FFFC Message Flow

Main Flow	
Scenario	"Happy Day:" Canada EDE successfully sends FFFC business objects to Industry.
Pre-Condition	Canada has prepared a Master Data package containing one or more FFFC business objects. Canada EDE has received initiation request and responded with creation of unit of work and manifest. Industry has replied to Canada EDE that unit of work is successfully created.
Post-Condition	FFFC business objects successfully received by Industry.
Steps	1) CMMS sends FFFC message to Canada EDE. 2) Canada EDE returns a "success" response to Canada CMMS. 3) Canada EDE invokes 'SendFFFC()' operation passing UOW ID and one or more FFFC business objects. (See Input Body definition.) Canada EDE waits for technical response. 4) Industry initiates "Type 1" validation. In this scenario there is no error. Industry accepts "custody" of the FFFC business objects in the message. 5) Industry returns to Canada EDE a "success" technical response for the SendFFFC() operation. (See Output Body definition.) a. Industry begins internal processing of the message. In this scenario there is no error. b. Industry saves FFFC business objects to send to Industry systems once unit of work is complete. Once Industry has received a complete Master Data package from Canada EDE, Industry will process the received data. The details of this process are out of scope of this specification.

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

4.3 Alternate Scenarios

The FFFC message flow with Type 1 fault sequence diagram is shown in Figure 4-3. The following scenarios apply to all uses of the FFFC 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 backend business system. Please see Service Interaction Model [Ref. 2] for details on these groupings.

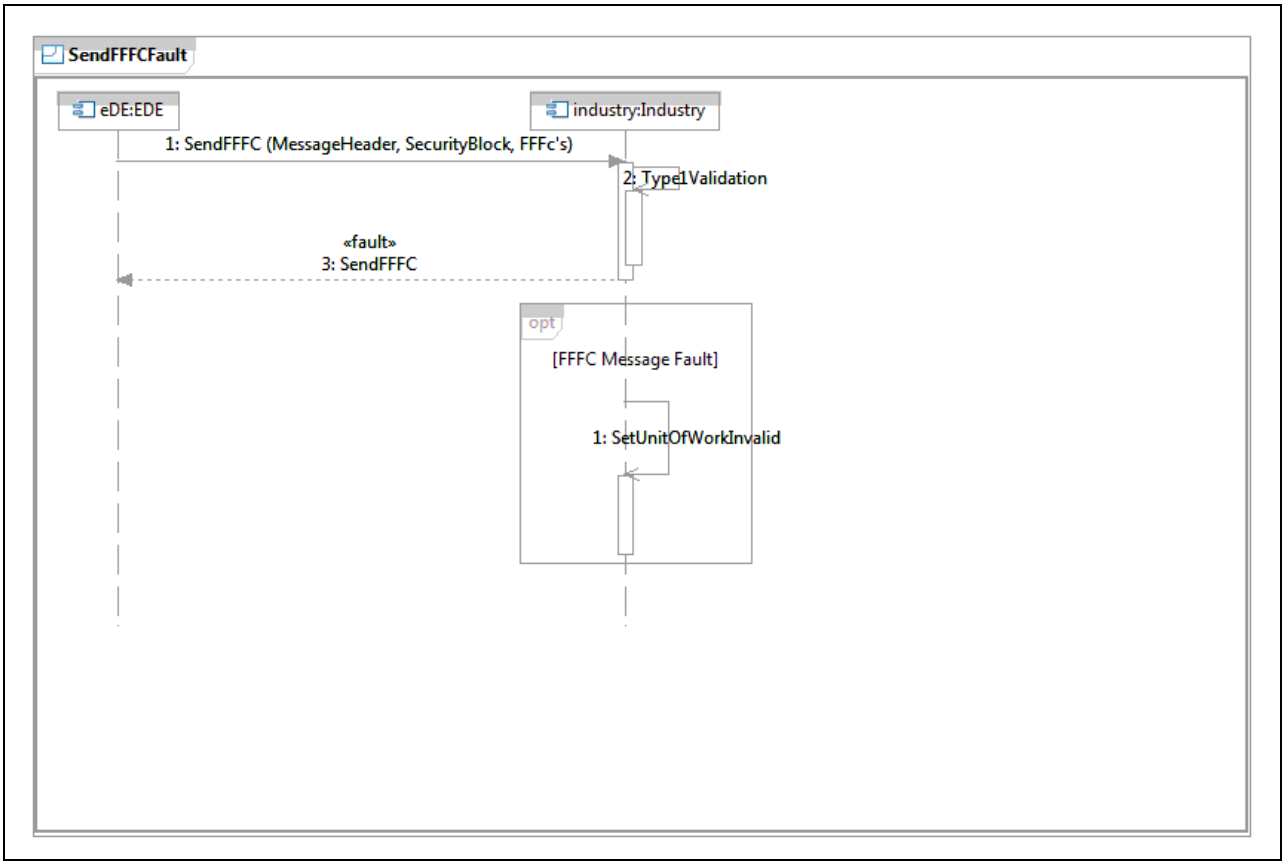

Figure 4-3 FFFC message flow with Type 1 fault

Alternate Flow 1	
Scenario	Type 1 Errors detected by Industry 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	Industry sends technical response containing a fault message (see Service Interaction Model [Ref. 2]) to Canada EDE. Canada EDE ceases sending Master Data (of **any** exchange type) for this unit of work.

Steps	1) Canada EDE invokes 'SendFFFC()' operation containing one or more FFFCs. 2) Industry checks for Type 1 errors – an error is found; 3) Industry constructs the fault message and sends the fault message to Canada EDE in the technical response to the original SendFFFC() operation invocation. (See Fault Body definition.) In the same iteration through the loop where a FFFC Message fault was found: **1)** Industry 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) Canada EDE may receive additional fault technical responses for other Master Data operations which were invoked for an invalid unit of work.

Alternate Flow 2 (Industry Service unresponsive)	
Scenario	Canada EDE does not receive technical response within ACK_TIME_INTERVAL.
Pre-Condition	Canada EDE has invoked the operation but does not receive the technical response within the time specified for the FFFC service.
Post-Condition	Canada EDE marks the message as Dead Message.
Steps	1) Canada EDE does not receive any response from Industry within the allowed ACK_TIME_INTERVAL. 2) Canada EDE 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 Canada EDE marks the request message as Dead and handles it via the Dead Message protocol (See Service Interaction Model [Ref. 2].
Alternate Flow 3 (Business Validation Failure)	
Scenario	Industry business validations fail on one or more Master Data business objects.
Pre-Condition	All business objects have been received by Industry, and Industry starts its data load process.
Post-Condition	Industry sends technical problem through TPMS interface to Canada EDE.
Steps	1) Industry invokes Canada EDE TPMS operation and receives a positive technical response.

5 Service Description – Form-Fit-Function Class Service

5.1 Service Overview

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

As part of the Form-Fit-Function Class service Canada EDE will implement and expose two operations:

- An error reporting operation optionally used by Industry to report business errors[5];
- An acknowledgement service optionally[6] used by Industry to report successful delivery of FFFC business objects to Canada EDE.

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

5.2 Service Properties

Service Property	Description
Enterprise Service Name (Business)	Form-Fit-Function Class Service
Enterprise Service Name (Technical)	FormFitFunctionClassService_Industry (Abbreviated in this document to FFFC service.)
Purpose	This service supports the Canada EDE Master Data. On the occurrence of business triggers, Canada EDE uses this service to send FFFC messages to Industry.
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
Service Provider	SendFFFC() - Industry SendFFFCAck() – Canada EDE SendFFFCError() - Canada EDE

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

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

Service Property	Description
Target Service Consumers	SendFFFC() - Canada EDE SendFFFCAck() – Industry SendFFFCError() – Industry
Business Process Supported (now)	Master Data processes: • Send Platform Data to ISS Contractor;
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 'SendFFFC()' Operation

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

5.4 'SendFFFCAck()' Operation[7]

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

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 'SendFFFCError()' Operation[8]

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

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

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

Section 7). Canada EDE's implementation of this operation will perform Type 1 validation on the error message. Canada EDE will return a technical response to Industry.

6 Information Model

This section describes the **business objects** which are used in the FFFC service. The Unified Modeling Language (UML) notation is used. A functional view[9] 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 FFFC

A Form-Fit-Function Class business object is used to describe parts (or, more generally, any item for which there is an MMR) which are allowable substitutes. Two business objects are used in a Parent/Child relationship. The "Parent" names a group of substitutes/variants and the "Child" business objects define the MMR's which are in the group.

Figure 6-1 shows the Information Model used in the Form-Fit-Function Class service. This section primarily discusses the structure of the information model, details of attributes may be found in the Master Data Business Guidelines [Ref. 3]. In the following *underlined italic* text refers to specific classes in Figure 6-1.

The class *FormFitFunctionClass* represents the parent. Its Id field uniquely identifies the group of substitutes/variants[10]. The class *FormFitFunctionClassVariant* represents the child. Each instance of *FormFitFunctionClassVariant* refers to a single MMR.

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

[10] Canada and Industry may agree on a convention for setting values of the FFFC_Id field.

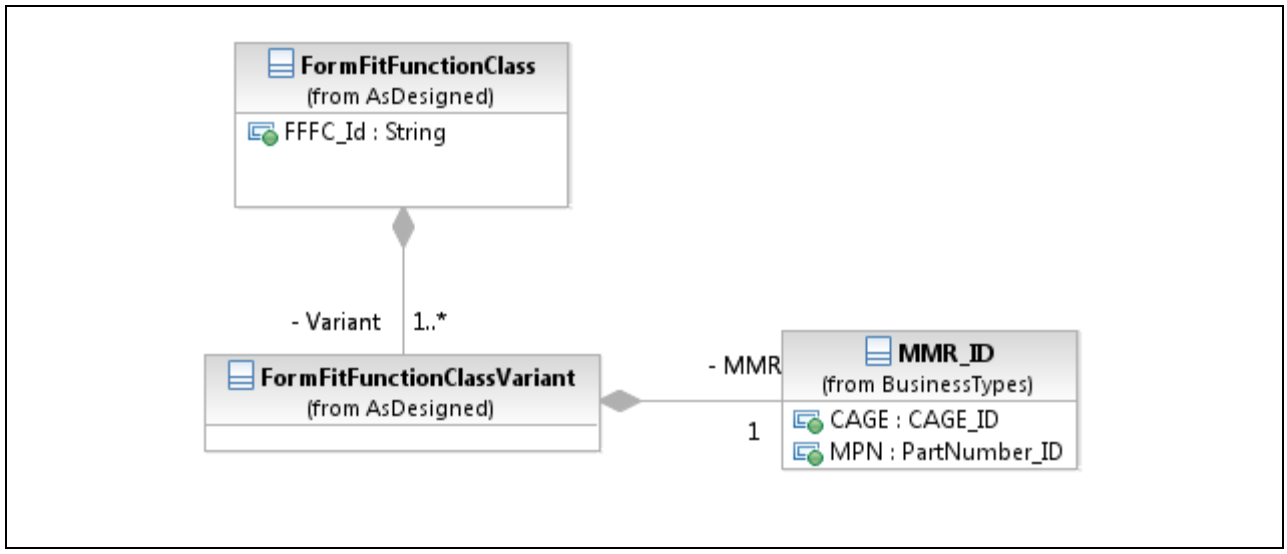

Figure 6-1 Information Model – Form-Fit-Function Class

6.2 As Designed Structure

The Form-Fit-Function Class is part of the WS "As Designed" structure. An overview of "As Designed" structure is shown in Figure 6-2 below; each business object is described in one of the Service Specification documents.

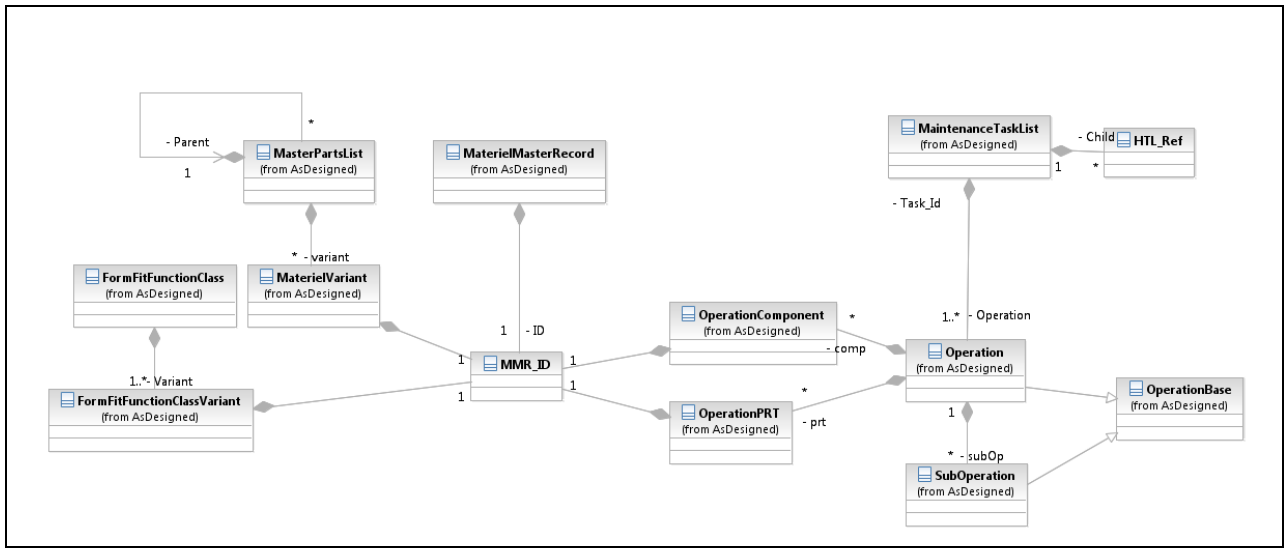

Figure 6-2 Information Model – As Designed Structure

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 Canada EDE 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 Canada EDE and may be replayed in error messages[11].

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 FFFC 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 FormFitFunctionClass.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 FFFC Input Body

As shown in Figure 7-1, an FFFC input body consists of:

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

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

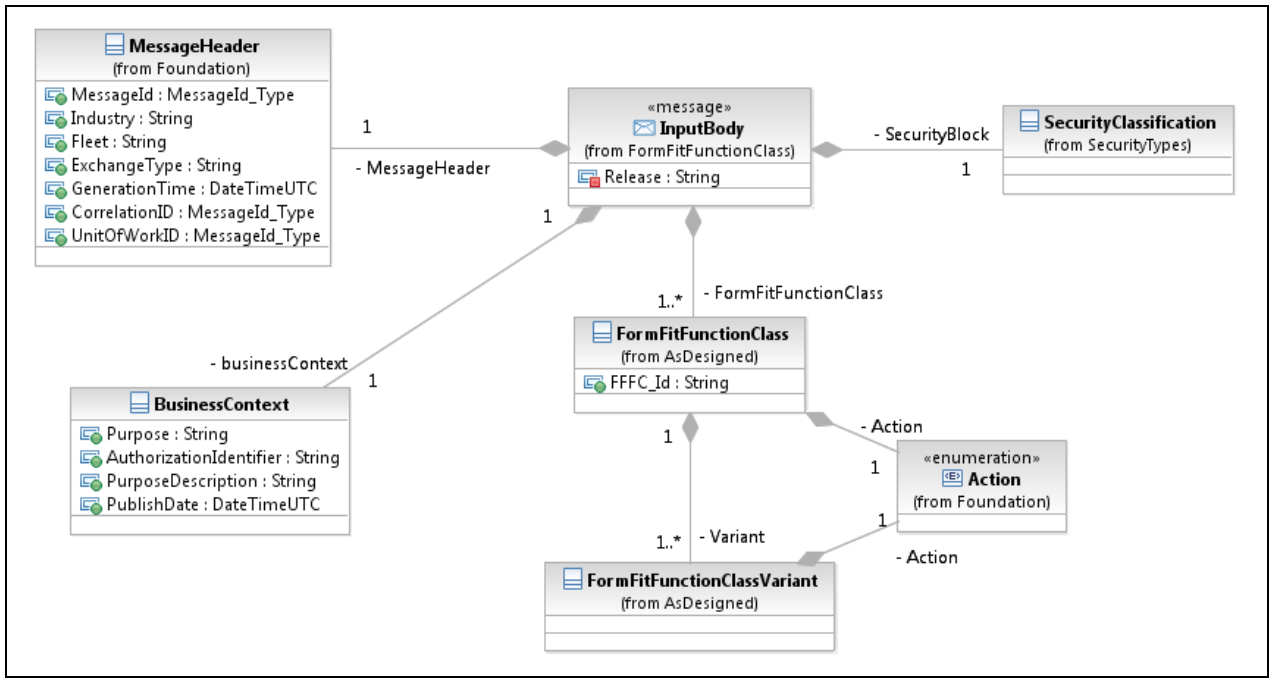

Figure 7-1 FFFC Input Body

The MessageHeader UnitofWorkID must equal the UnitofWorkID value of an existing valid unit of work[12]. The MessageHeader CorrelationID must equal the MessageId of the message which created the unit of work. Purpose and ContextDescription fields must match the corresponding fields in the Unit of Work which envelopes this input message.

The FFFC InputBody also contains an attribute 'Release' which designates the release of the FFFC 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[13].

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 FFFC 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 FFFC Output Body

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

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

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

- A Message Header;
- A Custody object.

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

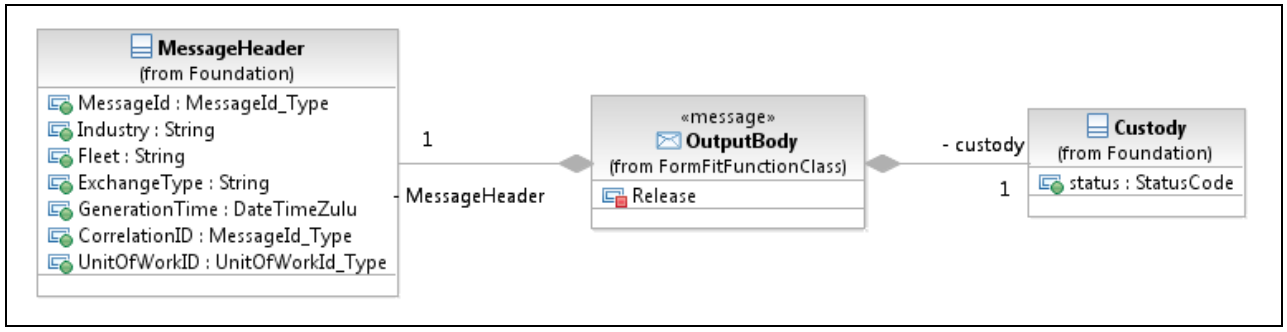

Figure 7-2 FFFC Output Body

For an FFFC OutputBody:

- The MessageHeader MessageId is a **new** unique value;
- The MessageHeader GenerationTime is the time the **output** message is generated;
- The MessageHeader CorrelationID is set to the MessageId of the FFFC Input Body;
- The MessageHeader Exchange Type must be set to the Exchange Type of the FFFC InputBody;
- The value of the Custody status field is “success”.

7.3 FFFC Fault Body

A fault returned by the SendFFFC() operation uses the FFFC FaultBody element. As shown in Figure 7-3, the FFFC 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.

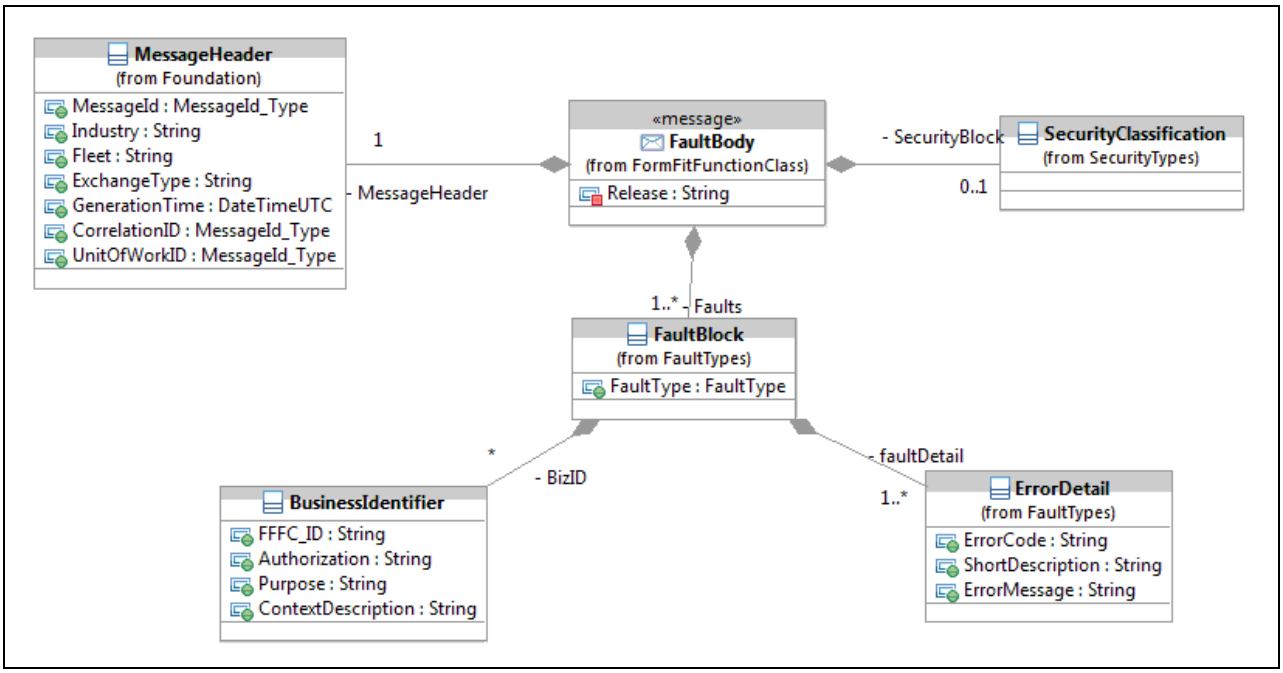

Figure 7-3 FFFC Fault Body

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 FFFC Acknowledgement Input Body

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

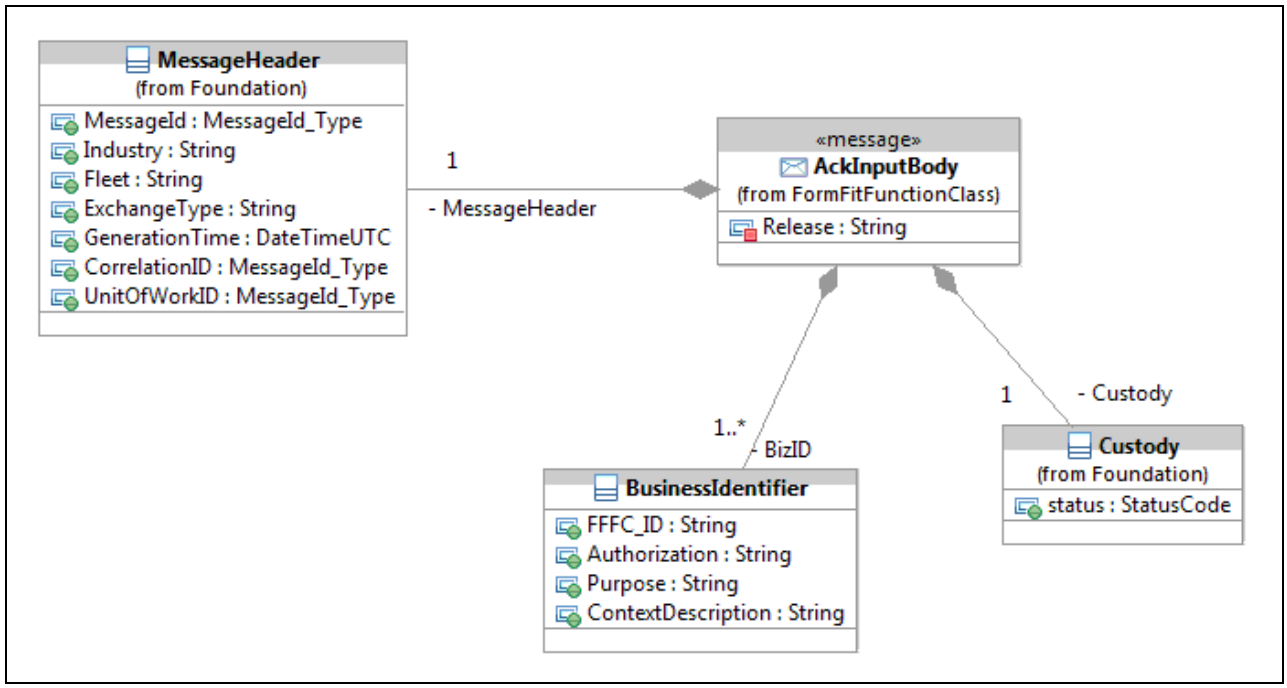

Figure 7-4 FFFC Acknowledgement Input Body

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

7.5 FFFC Error Input Body

The input to the SendFFFCError() operation consists of a Message Header, a Security Block and a list of Error Blocks, as shown in Figure 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.

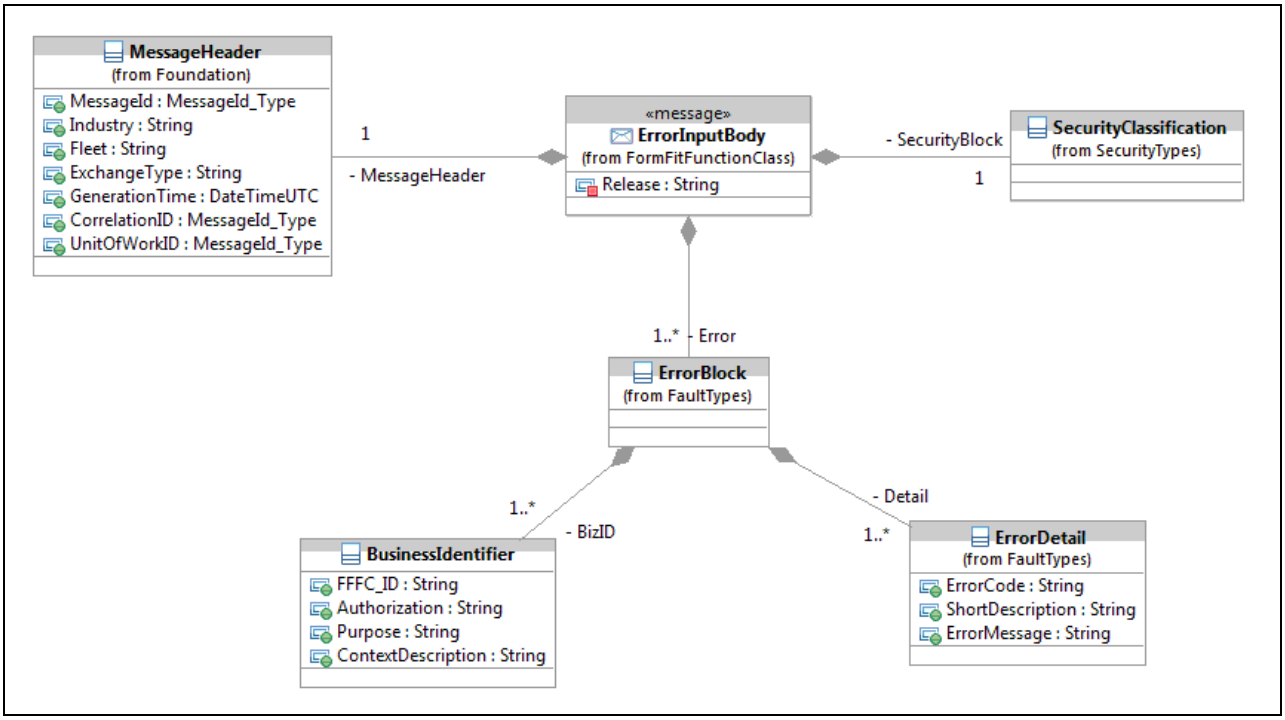

Figure 7-5 FFFC Error Input Body

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

The Message Header has a new unique MessageId.

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

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

The following diagram in Figure 7-6 shows the mapping for each of the three operations in the FFFC service - SendFFFC(), SendFFFCAck() and SendFFFCError() - to their respective input, output and fault bodies as further defined in the FFFC Web Service Definition Language (WSDL) file.

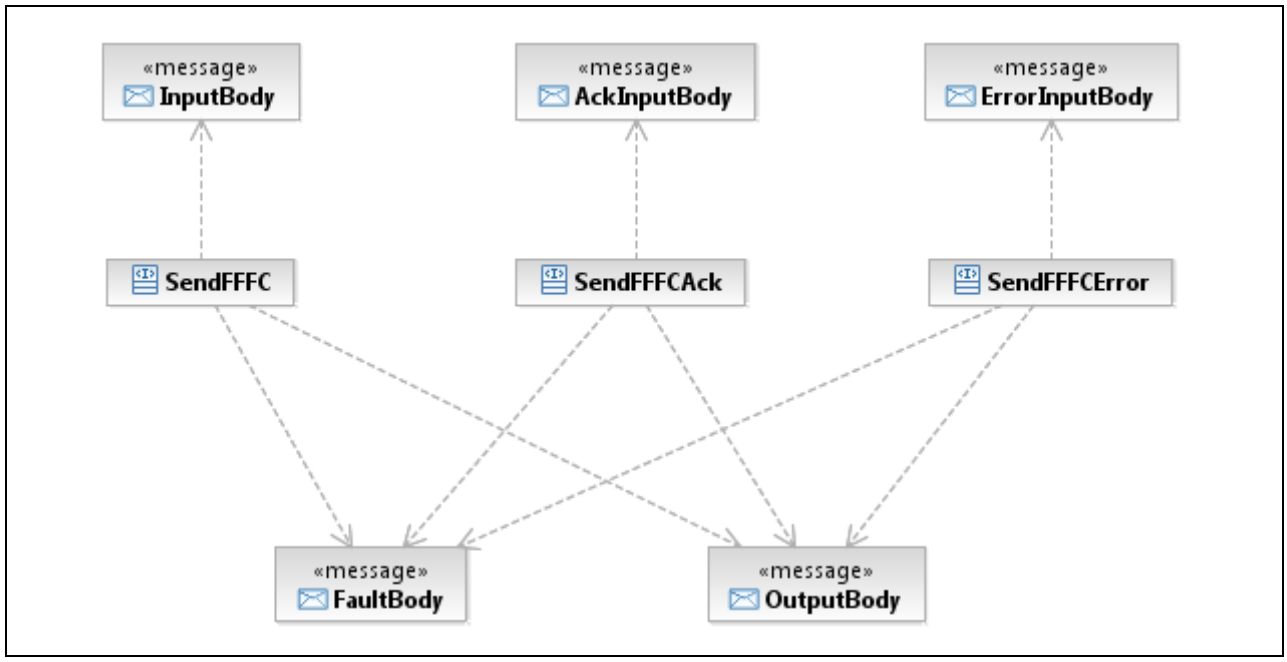

Figure 7-6 FFFC Operations to Input/Output/Fault Mapping

8 Service Operation Details

8.1 Detailed Operation Characteristics – SendFFFC()

Canada EDE will invoke the exposed Industry FFFC service through this operation. The input will consist of a FFFC 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 FFFC WSDL files for implementation details.

Detailed Operation Characteristics

Interface Definition	Description
Operation Name	Send FFFC
Operation Technical Name	SendFFFC()
Operation Description	This operation is invoked by Canada EDE to send one or more FFFC business objects 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 7.1 FFFC Input Body for details.
Output Message Definition	Please refer to Operation Message Model Section 7.2 FFFC Output Body for details.
Fault Definition	Please refer to Section 7.3 FFFC Fault Body for details. Please see Service Interaction Model [Ref. 2] for Type 1 faults.

Non-Functional Requirements

Non-Functional Requirements/Technical Details	
Frequency	May be periodic (catalogue updates) or 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.

Non-Functional Requirements/Technical Details	
Peak Throughput Volume	Based on Service Level Agreements (SLA) to be determined between Canada and Industry on a per ship class basis.
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 Canada EDE cannot successfully send FFFC business objects to Industry. See Service Interaction Model [Ref. 2].

8.2 Detailed Operation Characteristics – SendFFFCError()[14]

Industry *may* use this operation to inform Canada EDE of errors detected in internal processing and faults returned from delivery to Industry systems.

Please refer to FFFC WSDL files for implementation details.

Detailed Operation Characteristics

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

Interface Definition	Description
Operation Name	Send FFFC Error
Operation Technical Name	SendFFFCError()
Operation Description	This operation is invoked by Industry to send one or more FFFC errors 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 7.5 FFFC Error Input Body for details. Please refer to Service Interaction Model [Ref. 2] 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 FFFC Output Body for details.
Fault Definition	Please refer to Section 7.3 FFFC 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 SendFFFC() operation. Worst case is one error per FFFC business object.
Peak Throughput Time	Same as SendFFFC() operation.
Peak Throughput Volume	Same as SendFFFC() 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.

Non-Functional Requirements/Technical Details	
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.
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 Canada EDE cannot successfully send FFFC business objects to Industry. See Service Interaction Model [Ref. 2].

8.3 Detailed Operation Characteristics – SendFFFCAck()[15]

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

Please refer to FFFC WSDL files for implementation details.

Detailed Operation Characteristics

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

[15] 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 FFFC Ack Input Body for details.
Output Message Definition	Please refer to Operation Message Model Section 7.2 FFFC Output Body for details.
Fault Definition	Please refer to Section 7.3 FFFC 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	~ 2KB 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 Canada EDE cannot successfully send FFFC business objects to Industry. 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 Form-Fit-Function Class Service WSDL file for the precise binding.

8.4.2 SOAP Over JMS

Not currently supported.

8.4.3 XML files via SFTP

As an interim measure while an industry partner implements their web service infrastructure, Canada EDE supports sending XML files to a secure DND SFTP site for Industry consumption.

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
FFFC	Form-Fit-Function Class
FLOC	Functional LOCation
ISS	In Service Support
ISSCF	In Service Support Contracting Framework
MER	Master Equipment Record
MPL	Master Parts List
MPN	Manufacturer Part Number
MMR	Materiel Master Record
NATO	North Atlantic Treaty Organization
NSN	NATO Stock Number
PBC	Performance Based Contracting
SFTP	Secure File Transfer Protocol
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

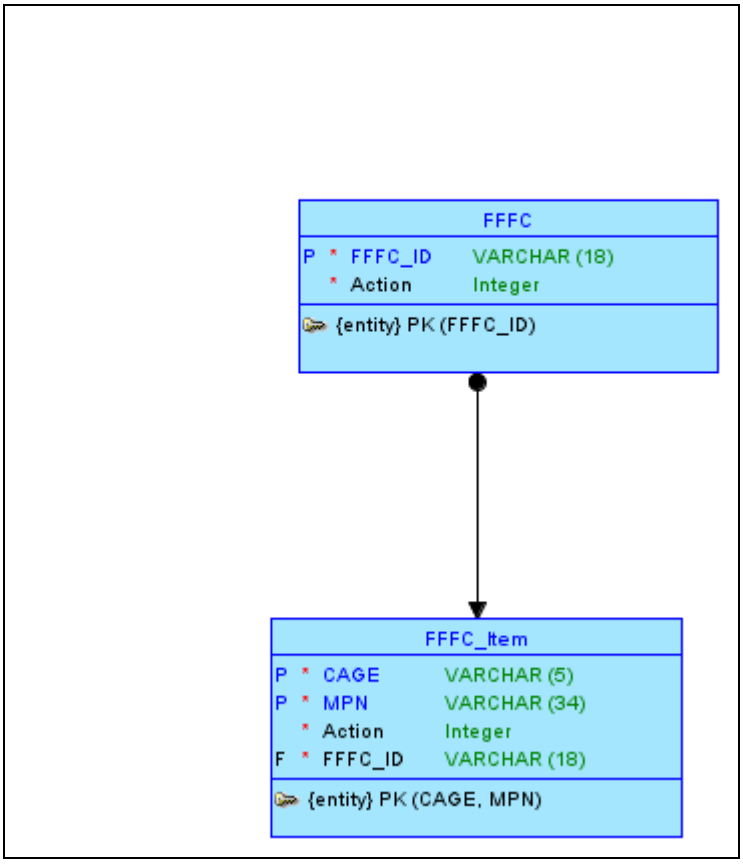

Figure 10-1 FFFC ERD

11 Document History

Revision Number	Description	Date
1.0	Ready for Navy RFP	30 October 2015