Electronic Information Environment (EIE)

EIE Project

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Service Specification Document/Interface Control Document

PBC Data Exchange

Navy Industry Unit of Work Service

(Canada to Industry)

For Industry partners who have been contracted to participate in an In-Service-Support phase of a Weapon System or Platform with Canada Department of National Defence.

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1   Introduction

This document establishes an interface between Canada Electronic Data Exchange (EDE) system and Industry responsible for maintenance of a ship class subject Performance Based Contracting (PBC). This interface will be used by Canada to send a request to Industry to create a new Unit of Work to group together a number of subsequent messages. The effect of the unit of work is that a non-recoverable error in any one message in the unit of work invalidates the unit of work and then Industry will reject any messages previously sent in the unit of work.

To support management of a unit of work between Canada EDE and Industry, 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 Data Package service includes an operation for Canada EDE to report acknowledgement messages back to Industry.

1.1   Intended Audience

- Industry Partner System Designers
- Canada EDE Designers
- Industry Testers
- Canada EDE Testers

1.2   References

[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]   Master Data for industry/ISSC Service Operational Model

[Ref. 4]   Electronic Information Environment Data Package Service Specification *(as applicable)*

2   Business Information

Business Information is based on the EIE Business Process model for Data Initialization [Ref. 1]. This section discusses business information only to the extent it impacts use of a Unit of Work, for full details please refer to [Ref. 1].

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

This business scenario requires an assurance that Industry has received the entire set of business objects from Canada before further processing. The unit of work provides the aggregation across all the messages carrying business objects delivered using multiple services from Canada EDE to Industry. The unit of work includes a manifest. The manifest is a structure declaring a count, by exchange type, of the number of business objects required to make up a complete data package. For example, on delivery of a new WS the manifest may stipulate 500 Equipment Master Records (EMRs), 100 Functional Locations (FLOCs), 200 Maintenance Plans, 100 Measurement Points, and 100 measurement documents are being sent to load the new WS from CMMS.

The **unit of work is an association amongst messages** which allows the message sender (Canada EDE) and receiver (Industry) to agree which messages are inter-dependent (largely for error-handling). The **manifest is an association amongst business objects** which allows Industry and Canada to agree on the content of a data package. Decoupling the message level and business object level supports greater flexibility in how business objects are combined into messages for transport purposes.

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

This section provides a high level view of business processes to establish the role of the Data Package service.

In a Master Data business process when Canada has a data package ready to send to Industry a direct[1] communication will take place between Industry and Canada DND to advise Industry of the availability

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

of new Master Data and a data package identifier (also known as **Authorization Identifier)**. Industry will request the data package based on an identifier and Canada must be ready to send the data.

Canada EDE will first create a unit of work with a manifest prior to sending business objects to Industry. The unit of work must have a unique identifier to associate with incoming messages. Canada EDE sends the business objects using the usual EIE services defined for various exchange types.

2.2   Business Triggers

As per the EIE Business Process model for Data Initialization [Ref. 1], the following business events may result in a Unit of Work created by Canada EDE:

- Send Platform data to ISS Contractor;

3   Business Constraints

Terminology

The input to the service is a **UnitofWork message** which consists of a single *"business object"* (the Unit of Work identifier and time-to-live) and metadata (e.g., message header) required for correct message processing between Canada and Industry.

Constraints on *Usage* of the Service

1) The Industry Unit of Work service shall only be invoked by Canada EDE. Canada EDE will only invoke this service upon business triggers (as above).

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

3) The unit of work identifier is a meaningless unique identifier (similar to message identifiers).

4) The unit of work identifier cannot be reused.

5) There may be more than one active unit of work at any one time.

6) Canada EDE must never send the same Business Object in more than one message (excluding retries). This prevents a Manifest over-count.

Constraints on *Behaviour* of the Service

7) The Unit of Work service shall operate in near-real time.

8) Canada EDE will not send business objects until Industry confirms successful creation of the Unit of Work.

9) Industry will authorize invocations of operations of the Unit of Work service.

10) Canada EDE will report any business processing errors through the Data Package Error operation exposed by Industry using a distinct and separate invocation.

11) Canada EDE may attempt to repeat operation invocations in response to technical faults. This behaviour is controlled by parameters for each operation. Please see Service Interaction Model [Ref. 2] for details.

4 Service Use Case

The requirements for the Unit of Work service are defined by one use case with several scenarios.

This use case describes the steps in sending the Unit of Work creation request to Industry and the interaction of the Unit of Work and Manifest with subsequent messages carrying business objects.

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.
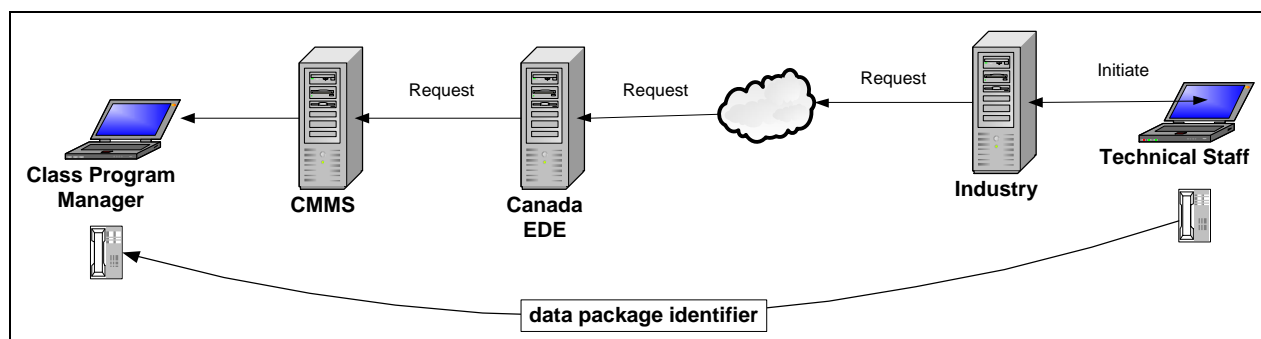

Figure 4-1 Data Package Request Service Context Master Data Processes

For a Master Data business process the following steps occur:

- Industry initiates the download of a Master Data package.
- Class Program Manager "releases" the data package.
- Canada EDE sends Unit of Work request to Industry.
- Industry creates unit of work and manifest and sends confirmation technical response to Canada EDE.
- Canada EDE begins to send Master Data.

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.

Business errors are handled between the CPM and Industry technical staff.

4.2 Successful Request and Technical Response

Figure 4-2 presents the Unit of Work main flow sequence diagram. This is the main or "Happy Day" scenario in the context of Master Data or Supply business processes. This scenario describes the interaction between Canada EDE and Industry for the Unit of Work Service.

Figure 4-2 Unit of Work Main Flow

Main Flow	
Scenario	"Happy Day:" Industry successfully sends Data Package request to Canada EDE.
Pre-Condition	Canada has a data package to send to Industry.
Post-Condition	Unit of Work successfully created by Industry and confirmed to Canada EDE.

Steps	1) Canada EDE invokes SendUnitOfWorkRequest() operation passing UnitOfWorkID, BusinessContext and Manifest. (See Input Body definition.)
	2) Industry validates the message. (See note below.)
	3) Industry creates unit of work with manifest.
	4) Industry returns to Canada EDE a "success" technical response for the SendUnitOfWorkRequest () operation. (See Output Body definition.)
	After "success" confirmation, Industry may begin sending business objects.
	1) Canada EDE invokes SendBusinessObjects()[2] operation.
	2) Industry returns to Canada EDE a "success" technical response for the SendBusinessObjects() operation.
	When the complete set of business object has been received – as per counts in the manifest – Industry may process the received data.

4.3   Alternate Scenarios for the Unit of Work Service

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

This scenario applies to Type 1 errors - namely those errors detected prior to the service provider accepting custody of a message.

For the Unit of Work service the following additional Type 1 errors are checked:

- Industry will validate that the Unit of Work ID is unique.

- Industry will validate that the exchange types declared in the Manifest are consistent with the Business Context of the Unit of Work[3].

- Industry will validate an exchange type appears at most once in the Manifest.

- Industry will validate that every exchange type count is a positive integer.

- Industry will validate that the time to live is a positive number.

Please see Service Interaction Model [Ref. 2] for details on Type 1 errors.

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[2] A generic operation 'SendBusinessObjects()' is used in scenarios in this document.

[3] For example, if the Business Context is for Supply then the Manifest should not declare expected counts for Maintenance Task List (MTL) or Materiel Master Record (MMR) exchange types.
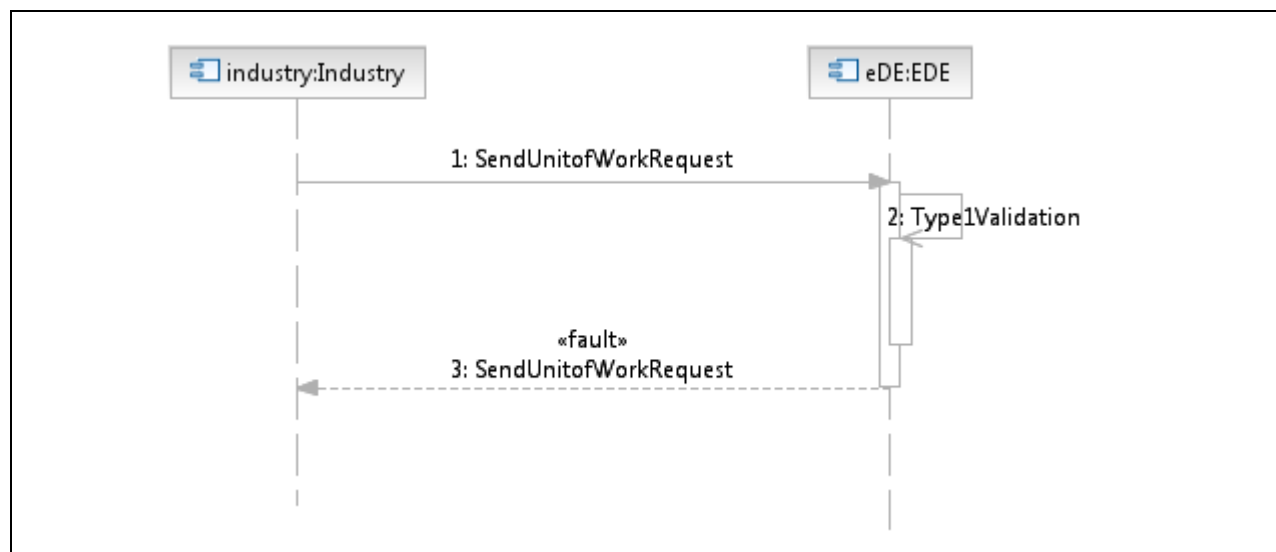
Figure 4-3 Unit of Work Alternate Flow 1 with Type 1 Error

Alternate Flow 1 – Type 1 Errors	
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 and Canada personnel communicate directly to resolve error(s) and initiate a new request.
Steps	1) Canada EDE invokes SendUnitOfWorkRequest() operation passing UnitOfWorkID, BusinessContext and Manifest. (See Input Body definition.) 2) Industry validates the message and discovers an error. 3) Industry returns to Canada EDE a "fault" technical response for the SendUnitOfWorkRequest () operation. (See Fault Body definition.) **After a "fault" Canada EDE should not send more business objects.**

For the Unit of Work service there are no "business" errors *per se*. Business errors may occur on the business objects sent to Industry in the scope of the Unit of Work (see Section 4.4 Interaction of Individual Invocation Errors and Unit of Work). The only "Type 2" error which may occur is expiration of the Unit of Work Time to Live before the complete set of business objects (as declared in the manifest)

has been received by Industry. The Unit of Work Alternate Flow 2 with Type 2 Error sequence diagram is shown in Figure 4-4.
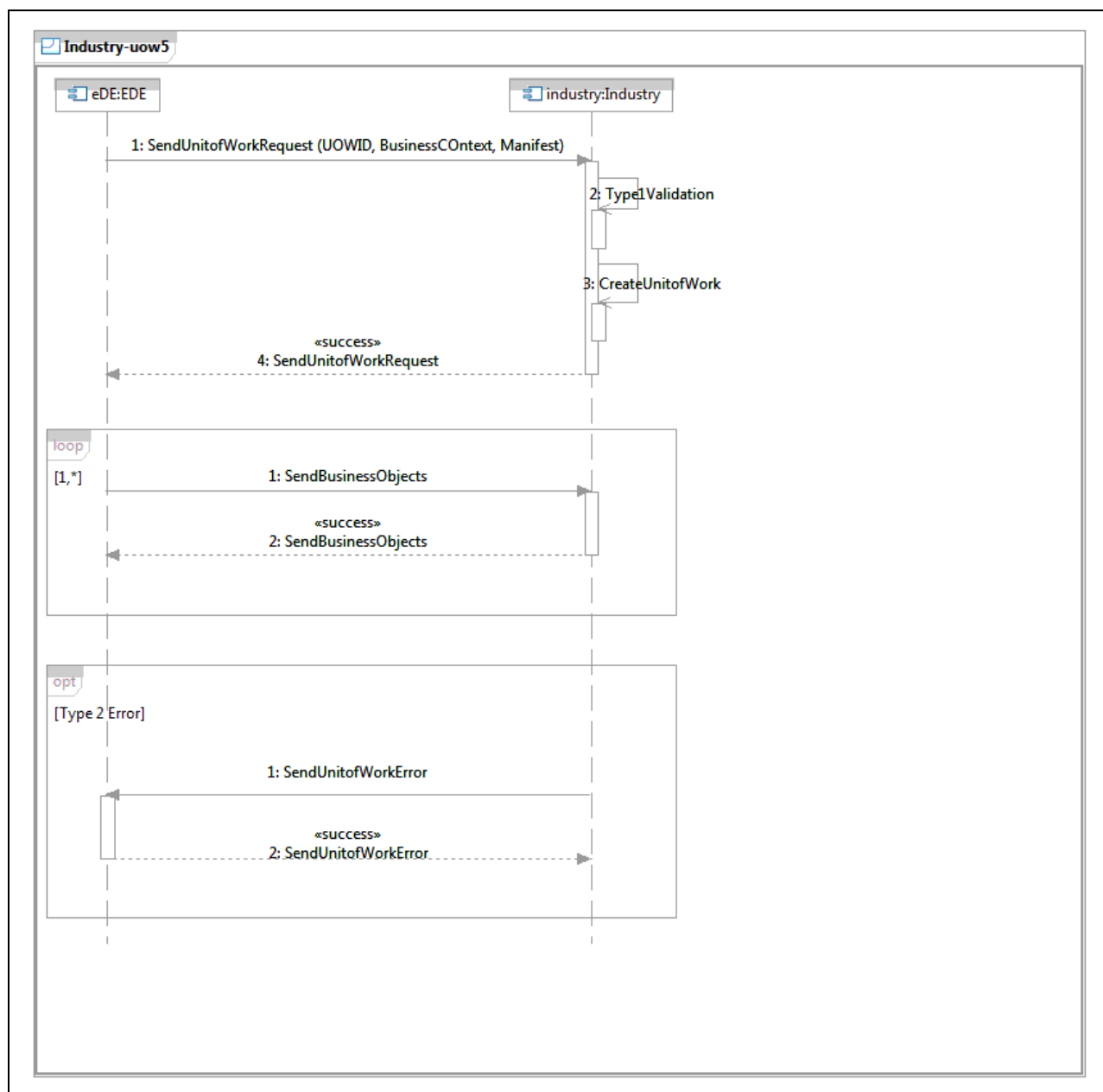

Figure 4-4 Unit of Work Alternate Flow 2 with Type 2 Error

Alternate Flow 2 – Type 2 Error	
Scenario	Type 2 Errors detected by Industry after processing business objects.
Pre-Condition	Unit of Work was successfully created and business objects sent to Industry. Unit of Work times out prior to complete set of business objects being received.
Post-Condition	Unit of Work is marked as invalid. Business objects in the Unit of Work are not sent to Industry backend systems. Industry and Canada personnel communicate directly to resolve error(s) and initiate a new request.
Steps	1) Canada EDE invokes SendUnitOfWorkRequest() operation passing UnitOfWorkID, BusinessContext and Manifest. (See Input Body definition.) 2) Industry validates the message. (See note below.) 3) Industry creates unit of work with manifest. 4) Industry returns to Canada EDE a "success" technical response for the SendUnitOfWorkRequest () operation. (See Output Body definition.) **After "success" confirmation, Canada EDE may begin sending business objects.** 1) Canada EDE invokes SendBusinessObjects()[4] operation. 2) Industry returns to Canada EDE a "success" technical response for the SendBusinessObjects() operation. **If the complete set of business object has not been received and the Unit of Work times out Industry sends an error.** 1) Industry invokes 'SendUnitOfWorkError()' operation on Canada EDE. Industry waits for technical response. (See Error Input Body definition.) 2) Canada EDE returns a "success" technical response to Industry.

Alternate Flow 3 (Canada Service unresponsive)	
Scenario	Canada EDE does not receive technical response within ACK_TIME_INTERVAL.
Pre-Condition	Same as Main Flow
Post-Condition	Canada EDE marks the message as Dead Message.

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[4] A generic operation 'SendBusinessObjects()' is used in scenarios in this document.

Steps	1) Canada EDE invokes SendUnitOfWorkRequest() operation passing UnitOfWorkID, BusinessContext and Manifest. (See Input Body definition.)
	2) Canada EDE does not receive any response from Industry within the allowed ACK_TIME_INTERVAL.
	3) Canada EDE will retry sending the message up to the defined maximum retry count and/or Time to Live interval.
	4) 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]).

4.4 Interaction of Individual Invocation Errors and Unit of Work

In the following, assume all 'SendBusinessObjects()' invocations are in the same Unit of Work.

This section specifies the system behaviour after a Unit of Work has been successfully created and faults occur in subsequent messages in the scope of the Unit of Work. In particular, errors in individual messages impact the unit of work state itself and the processing of other messages in the unit of work.

A Unit of Work's scope includes multiple messages – typically[5] of several exchange types. When an error occurs in one message it will invalidate the entire unit of work. Industry will not attempt to forward previously accepted messages once their Unit of Work becomes invalid. Industry will not send an explicit error message for any message that was previously accepted. The Unit of Work Alternate Flow 3 with Type 1 Error is shown in Figure 4-5; and the Unit of Work Alternate Flow 4 – Concurrent Messages sequence diagram is shown in Figure 4-6.

When a message is in the scope of a unit of work the following additional Type 1 validations are performed by Industry:

- The Unit of Work is in a valid state (see 'Open' and 'Expired' states in Section 4.5);

For the following assume the exchange type of the subject message is **T**.

- Validate the manifest contains a count for **T**. If not, the message is rejected.

- If the message will cause the Manifest to "overflow", the message is rejected. Specifically:

   o The manifest has a required count for **T** of n_1. (> 0).

   o The accumulated count for **T** (business objects of type **T** already received) is n_2.

   o The subject message contains n_3 business objects of type **T**.

   o Then Industry checks $n_2 + n_3 > n_1$.

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[5] But not necessarily.

In other words, if the number of business objects in the current message (n_3) plus the number received previously (n_2) exceeds the expected number (n_1), there is an "overflow".
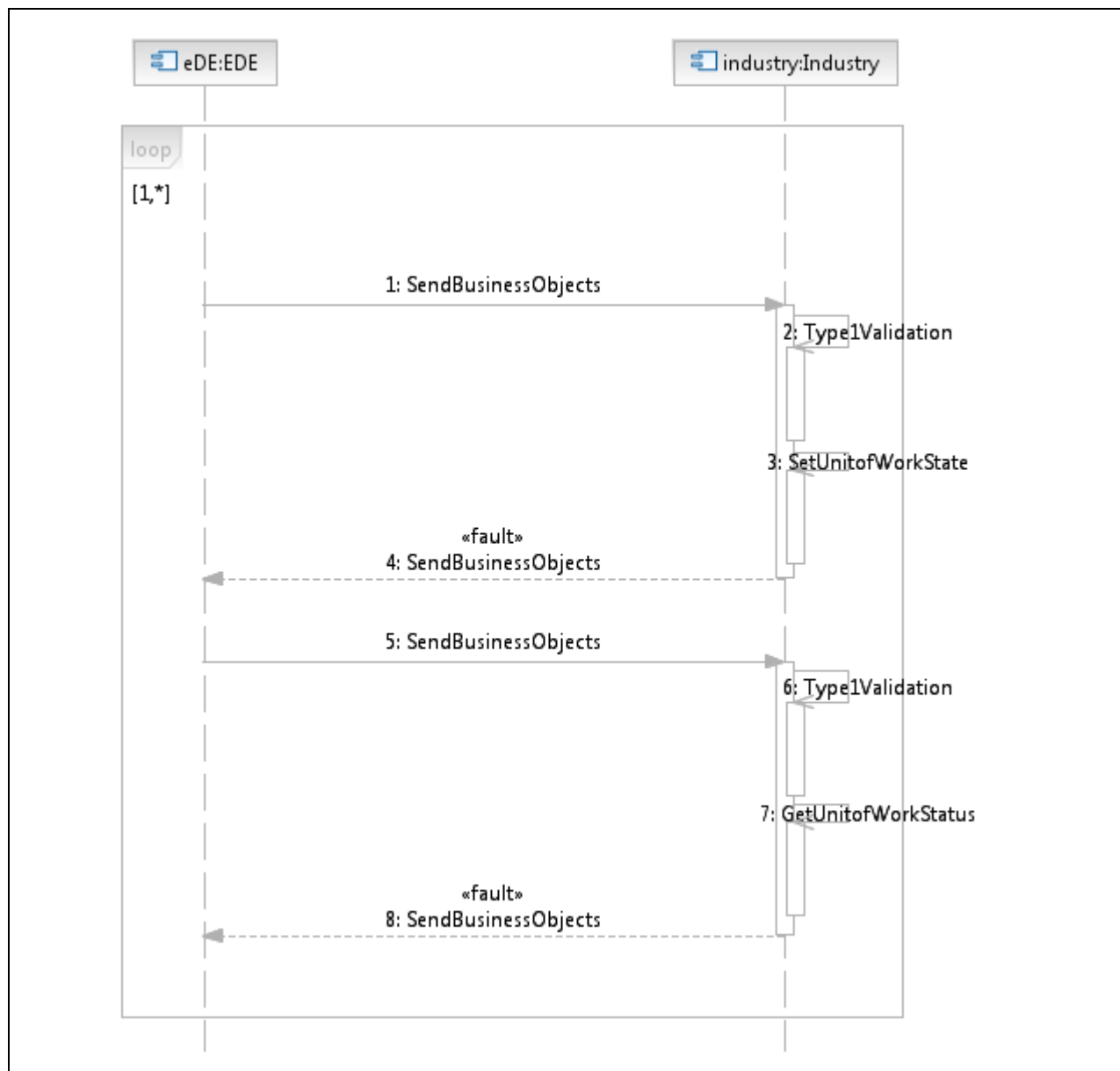

Figure 4-5 Unit of Work Alternate Flow 3 with Type 1 Error

Alternate Flow 4 (Unit of Work Becomes Invalid)	
Scenario	Type 1 Errors detected by Industry prior to accepting custody of a message.
Pre-Condition	A Unit of Work has been successfully created.
Post-Condition	Unit of Work is marked as invalid. No business objects are sent to Industry backend systems. Any further messages in the Unit of Work will fail validation.
Steps	1) Canada EDE invokes SendBusinessObjects() operation passing Message Header, Security Block and business objects. (See service specifications for specific exchange types.) 2) Industry validates the message and discovers an error. 3) Industry sets the Unit of Work state to "**Fault** (See States.) 4) Industry returns to Canada EDE a "fault" technical response for the SendBusinessObjects () operation. (See Fault Body definition.) 5) Canada EDE invokes another SendBusinessObjects() operation. 6) Industry validates the message. 7) Industry checks state of Unit of Work, it is "**invalid**." 8) Industry returns to Canada EDE a "fault" technical response for the SendBusinessObjects () operation. **Once the Unit Of Work is invalid, subsequent messages will fail validation.**

Figure 4-6 Unit of Work Alternate Flow 4 – Concurrent Messages

Alternate Flow 5 (Concurrent Messages)	
Scenario[6]	Interaction of concurrent messages through affect on Unit of Work.
Pre-Condition	A Unit of Work has been successfully created.
Post-Condition	Unit of Work is marked as invalid. No business objects are sent to Industry backend systems. Further messages in the Unit of Work will fail validation.

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[6] This is a possible but unlikely scenario.

Steps	1) Canada EDE invokes SendBusinessObjects() operation passing Message Header, Security Block and business objects. This is referred to a message A.
	2) Industry validates message A and does not discover an error.
	3) Canada EDE invokes SendBusinessObjects() operation, this is referred to as message B. Messages A and B are in the same Unit of Work.
	4) Industry validates message B and discovers an error.
	5) Industry sets the Unit of Work state to "**Fault**".
	6) Industry returns a "fault" technical response to Canada EDE for message B.
	7) Continuing with message A, Industry checks Unit of Work state; it is "**Fault**." In the time since message A was sent, message B caused the unit of work to become invalid.
	8) Industry returns to Canada EDE a "fault" technical response for the SendBusinessObjects () operation
	After a "fault" subsequent messages will fail validation.

4.5 States of Manifest and Unit of Work

This section describes the overall effect of the Unit of Work on EIE message exchange by defining the possible states of a Unit of Work and its manifest.

The state of a manifest is determined by the counts of business objects expected (by exchange type) *vs*. the number received. For any exchange type **T**, the manifest may be

- **full** – count of business objects received equals expected counts;

- **not full –** count of business objects received less than the expected count;

The Unit of Work states and message processing rules are defined as follows:

State	Description
Open	The Unit of Work has been successfully created. Positive technical response has been returned to Canada EDE. • Messages are being processed without faults.

State	Description
Fulfilled	The counts of business objects received exactly match the expected counts as declared in the manifest and time to live (TTL) has not expired. • Any subsequent messages in the Unit of Work are rejected.
Expired	The Unit of Work time to live (TTL) has expired. • Any messages, whose generation time is prior to the TTL expiry[7] are processed completely (equivalent to the Unit of Work being in Open state). After processing such messages the Unit of Work state changes to **Fulfilled** or **Incomplete**. • Any later messages will be rejected with an error indicating the Unit of Work is expired.
Incomplete	The Unit of Work state was **Expired** and manifest counts were not met. • Any subsequent messages in the Unit of Work are rejected.
Fault	A fault has occurred in a message. • The technical response to the message indicates the Unit of Work state. • Any subsequent messages in the Unit of Work are rejected.

In the majority of cases the Unit of Work will be created and remain in the **Open** state until it becomes **Fulfilled**, at which time transmission to CMMS can begin.

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[7] With an allowance for clock drift between Industry and Canada EDE systems.

5 Service Description – Unit of Work Service

5.1 Service Overview

Unit of Work service requires interacting web services exposed by Industry and Canada EDE. Industry will implement and expose a service and operation which Canada EDE will use to create a Unit of Work (see Section 7 for message definition). After receipt of the input message, Industry will return a technical response back to Canada EDE indicating success or failure in creation of the unit of work. If a fault occurs during processing of a message in the scope of a Unit of Work the fault technical response of the subject message will explicitly indicate the Unit of Work is invalid. If a Unit of Work time to live expires Industry calls a Canada EDE error reporting operation.

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

5.2 Service Properties

Service Property	Description
Enterprise Service Name (Business)	Unit of Work Service
Enterprise Service Name (Technical)	UnitOfWorkService_Industry
Purpose	This service supports a business process where a package of multiple inter-dependant business objects – possibly of many types – are to be sent by Canada EDE to Industry and Canada requires assurance from Industry that all business objects have been received successfully.
Business Response Time Interval	Not Applicable
Service Domain	Cross Domain
Business Owner	ADM (IM)
Service Grouping	Cross Domain / Unit of Work
Target Service Provider	SendUnitOfWorkRequest() - Industry SendUnitofWorkError () - Canada EDE
Target Service Consumers	SendUnitOfWorkRequest() - Canada EDE SendUnitofWorkError () - Industry

Service Property	Description
Business Process Supported (now)	Master Data processes: • Send Master Data to ISS Contractor; •
Business Process Supported (future)	None identified.
Business Objective Supported	See Section 2: Business Information.
Expected life time	The full lifecycle of the subject weapons system.

5.3 'SendUnitofWorkRequest()' Operation

This operation is used by Canada EDE to send a Unit of Work input message to Industry. Industry's implementation of this operation will perform Type 1 validation on the Unit of Work message. Industry will return a status or fault information to Canada EDE in a technical response. A status of "**success**" is confirmation Industry has created the Unit of Work. 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 'SendUnitofWorkError()' Operation

This operation is used by Industry to send an error message to Canada EDE after internal message processing detects a Type 2 error condition (currently just Unit of Work timeout). The specific Unit of Work which is in error is identified by its UnitOfWorkID in the business identifiers input to the error operation. 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 Data Package service.

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   Unit of Work

The Unit of Work Request sequence diagram is shown in Figure 6-1.

The *UnitofWork* class is used to describe the requested data package. It contains two attributes:

- UnitOfWorkID: a unique identifier which is used as a reference in all messages within the scope of the Unit of Work (in the MessageHeader).

- TimeToLive: the time during which Industry will accept messages in the scope of the unit of work. Units are hours.

The *Manifest* class contains a set of ExchangeTypes and the expected count per exchange type.

The *BusinessContext* class contains additional meta-data required to process the *UnitOfWork*.

- Purpose is a required attribute used by Industry to determine the applicable processing rules for the *UnitOfWork*[8]. The allowed values of the Purpose element are determined between Canada and Industry and managed as reference data. Mandatory in all units of work.

- AuthorizationIdentifier is used in Master Data processes to record the authorization under which the unit of work is sent by Canada EDE. If the unit of work is in response to an explicit data package request this value must be the same as used in the SendDataPackageRequest (see [Ref. 5]). Mandatory in Master Data processes, optional in Supply processes.

- PurposeDescription is any text which clarifies the usage of the business. For example, if the Purpose is InitialDataLoad of a new WS, the PurposeDescription could be an identifier for the WS (e.g., tail number of an aircraft). Optional.

- PublishDate is the date when Canada EDE made the data package available to Industry. Optional.

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[8] The processing rules are specified in the Message Operating Model document for each Business Domain.
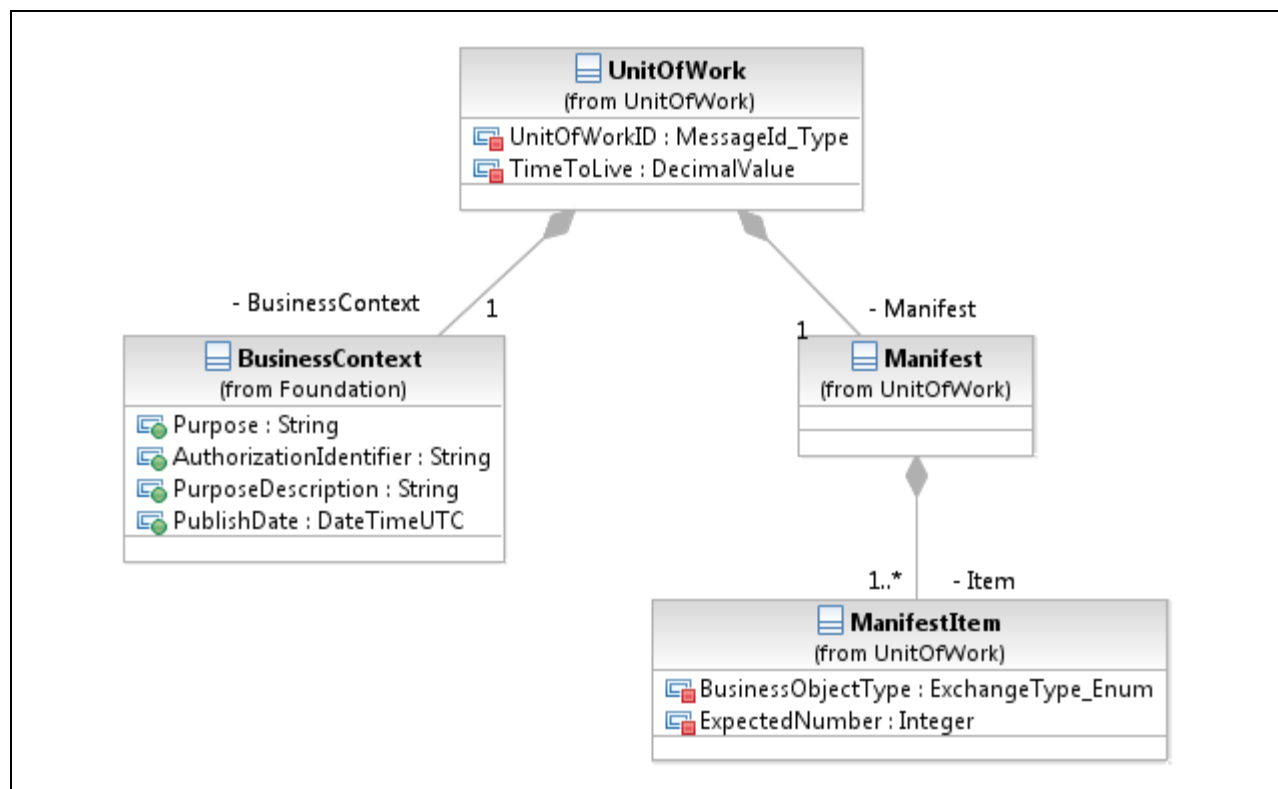
Figure 6-1 Unit of Work Request

Other Business Purposes may be added if needed.

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.

The Data Package service follows 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 element.

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 Message Header

This is included to highlight the UnitOfWorkID. Any "business-object" messages which are part of a Unit of Work **must** correctly set the UnitOfWorkID in their header (see Figure 7-1).

Messages pertaining to the creation of a Unit of Work do not set the UnitOfWorkID in their header as these are meta-data messages **about** the Unit of Work, not business object messages **part of** the Unit of Work.
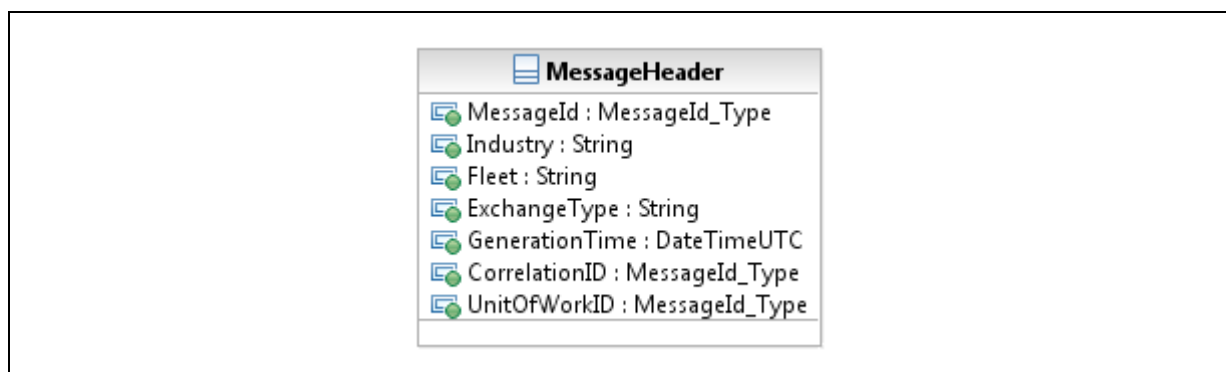

Figure 7-1 Information Model –Data Package Request

7.2 Unit of Work Input Body

As shown in Figure 7-2, a Unit of Work input body consists of:

- A Message Header;
- A Security Block;
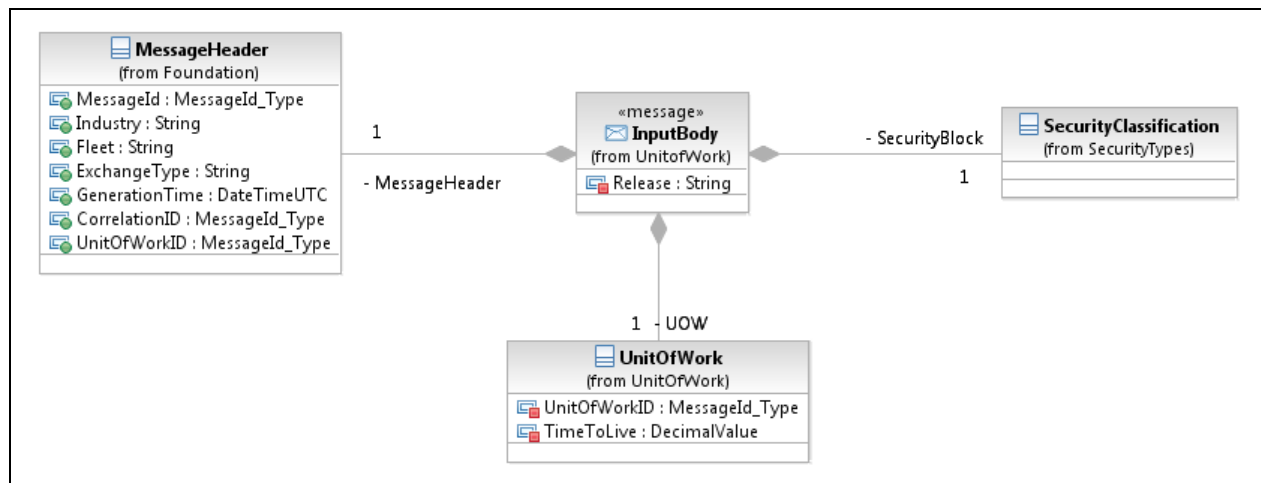- A UnitOfWork object (and contained objects as in Figure 6-1).

Figure 7-2 Data Package Input Body

The MessageHeader UnitofWorkID and Correlation ID are not used as part of the request for creation of a new unit of work.

The Unit of Work InputBody also contains an attribute "Release" which designates the release of the Unit of Work InputBody and the Unit of Work service. The "Release" attribute appears 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.

7.3   Unit of Work Output Body

The output of the SendUnitOfWorkRequest() operation is the UnitOfWork OutputBody. As shown in Figure 7-3, the output body consists of:

- A Message Header;
- A Custody object.

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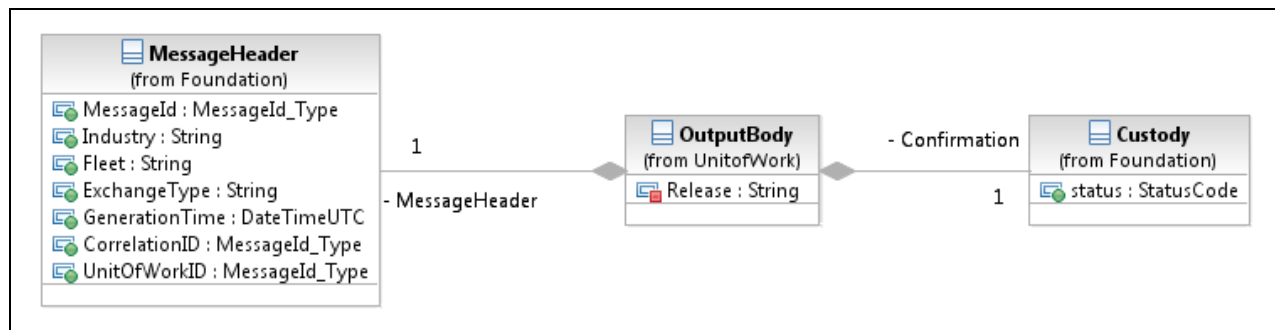

Figure 7-3 Unit Of Work Output Body

For a Data Package OutputBody:

- The MessageHeader Message Id is a new unique value;

- The MessageHeader Correlation ID is set to the MessageID of the Unit of Work Input Body;

- The MessageHeader Exchange Type must be set to the Exchange Type of the Unit of Work InputBody;

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

7.4   Unit of Work Fault Body

A fault returned by the SendUnitOfWorkRequest() operation uses the Unit of Work FaultBody element. As shown in Figure 7-4, the UnitOfWorkFaultBody consists of:

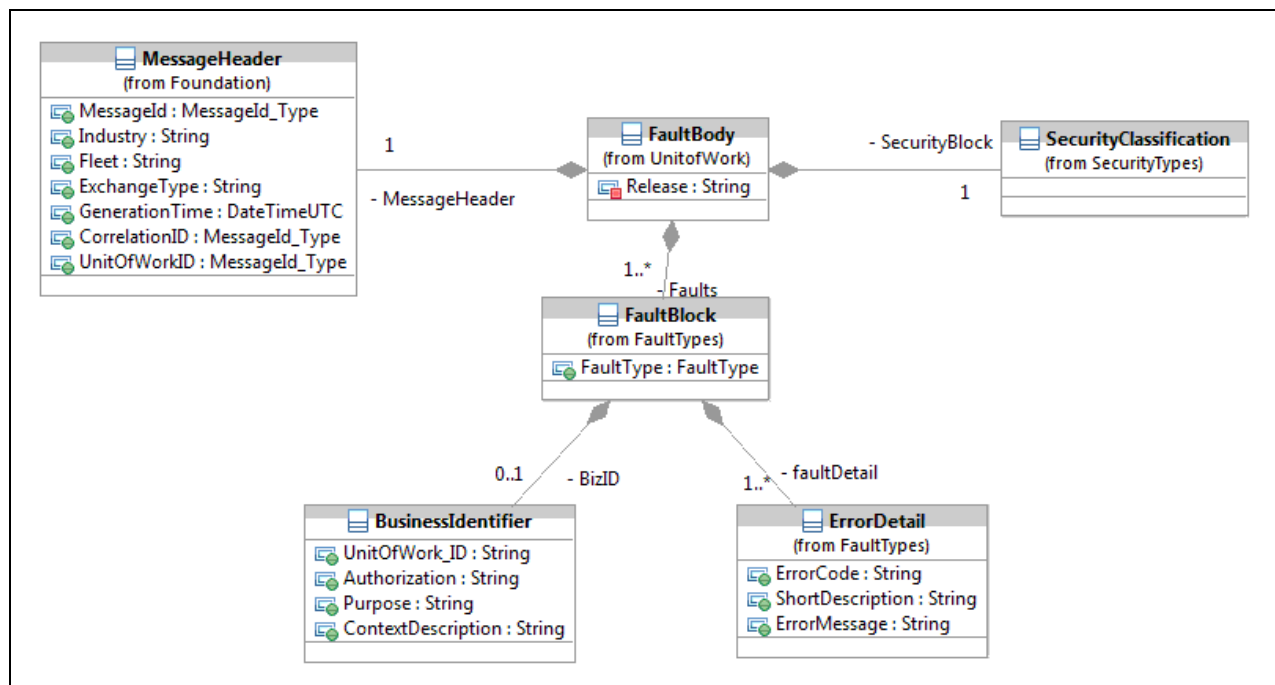- A Message Header;
- A Security Block;
- A Fault Block.

Figure 7-4 UnitOfWork Fault Body

MessageHeader is mandatory, but only MessageID and GenerationTime are mandatory within the header. This is for the scenario where the input message is so damaged that the necessary attributes cannot be recovered.

7.5 Unit of Work Error Input Body

The input to the SendUnirtOfWorkError() 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 a business object (by business identifier) and a list of one or more errors pertaining to the business object.
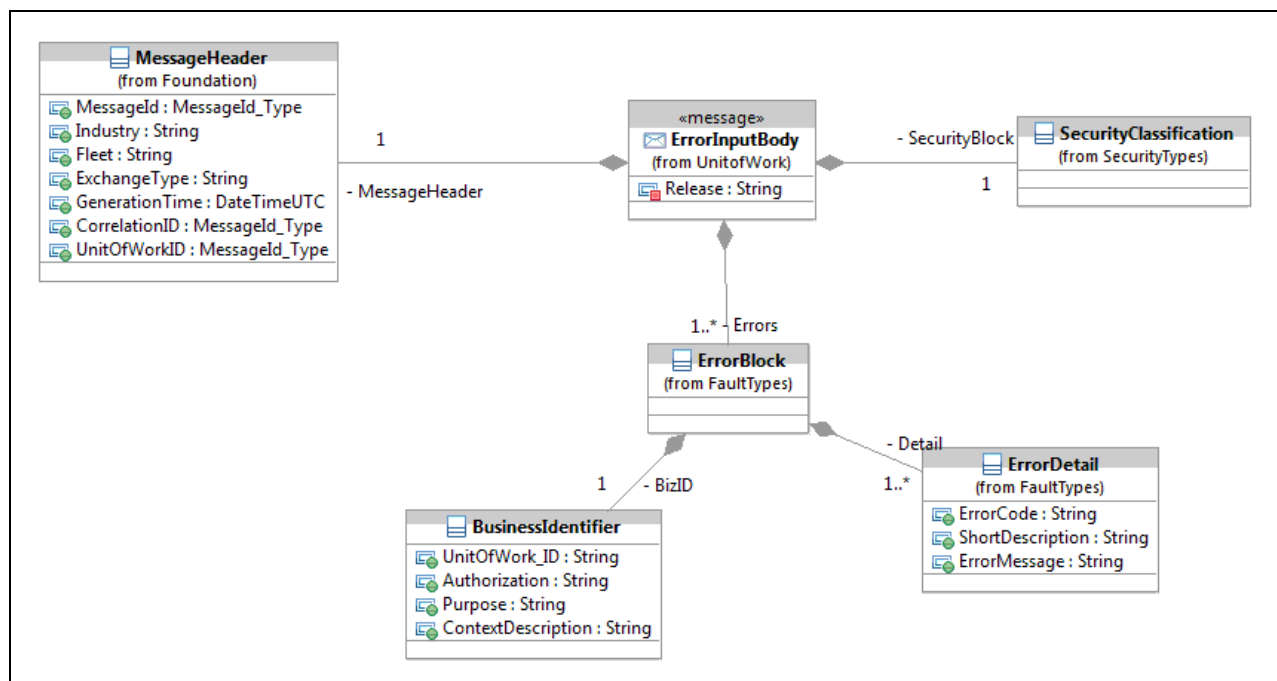

Figure 7-5 Unit of Work Error Input Body

MessageHeader and SecurityClassification are mandatory as in this scenario (after Type 1 validation has passed) the input message is well-formed. UnitOfWorkID is not used.

The Message Header has a new unique Message ID.

If the error is a Type 2 error detected by Industry, then Correlation ID and UnitOfWorkID are omitted.

8 Service Operation Details

8.1 Detailed Operation Characteristics – SendUnitOfWorkRequest()

- Canada EDE will invoke the exposed Industry Unit of Work service through this operation. The input will consist of a UnitOfWork 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 UnitOfWork Web Service Definition Language (WSDL) files for implementation details.

Detailed Operation Characteristics

Interface Definition	Description
Operation Name	Send Unit Of Work Request
Operation Technical Name	SendUnitOfWorkRequest()
Operation Description	This operation is invoked by Canada EDE to create a UnitOfWork and Manifest by Industry prior to transfer of a data package of business objects.
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 7.2 Unit Of Work Input Body for details.
Output Message Definition	Please refer to Operation Message Model Section 7.3 Unit Of Work Output Body for details.
Fault Definition	Please refer to Section 7.4 Unit Of Work Fault Body for details. Please refer to Service Interaction Model [Ref. 2] for Type 1 faults.

Non Functional Requirements

Non Functional Requirements/Technical Details	
Frequency	A-periodic
Peak Throughput Time	Regular business hours of the Main Operating base (MOB).
Peak Throughput Volume	Likely less than ten per week.

Non Functional Requirements/Technical Details	
Payload Size	1kB.
Attachments	None
Attachment Size	N/A
ACK Time Interval	Nominal value is 2 minutes.
Retry Time Interval	Nominal value is 10 minutes.
Number of Retries	Nominal value is 3 retries.
Biz. Response Time Interval	N/A
Time to Live Span	Dependant on the Unit of Work Purpose and the number and size of business objects to be exchanged.
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 Data Package business objects to Industry. See Service Interaction Model [Ref. 2].

8.2   Detailed Operation Characteristics – SendUnitOfWorkError()

Industry will use this operation to inform Canada EDE of errors detected in internal processing.

Please refer to Unit of Work WSDL files for implementation details.

Detailed Operation Characteristics

Interface Definition	Description
Operation Name	Send Unit of Work Error
Operation Technical Name	SendUnitOfWorkError()
Operation Description	This operation is invoked by Industry to send one or more Unit of Work errors to Canada EDE.

Interface Definition	Description
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 Unit Of Work Error Input Body for details.
Output Message Definition	Please refer to Operation Message Model Section 7.3 Unit Of Work Output Body for details.
Fault Definition	Please refer to Section 7.4 Unit Of Work Fault Body for details. Please refer to Service Interaction Model [Ref. 2] for Type 1 faults.

Non Functional Requirements

Non Functional Requirements/Technical Details	
Frequency	Same as SendDataPackage() operation. Worst case is one error per MMR business object.
Peak Throughput Time	Same as SendDataPackage () operation.
Peak Throughput Volume	Same as SendDataPackage () 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
Retry Time Interval	Nominal value is 10 minutes
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	N/A
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

Non Functional Requirements/Technical Details	
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 MMR business objects to Industry. See Service Interaction Model [Ref. 2].

8.3   Service Bindings

8.3.1   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. See the Data Package Service WSDL file for the precise binding.

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

8.3.2   SOAP Over JMS

Not currently supported.

8.3.3   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
ADM (IM)	Assistant Deputy Minister (Information Management)
CPM	Class Program Manager
CM	Configuration Management
CMMS	Canada Maintenance Management System
CSS	Canada Supply System
DND	Department of National Defence
DRMIS	Defence Resource Management Information System
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
MMR	Materiel Master Record
MTL	Maintenance Task List
PBC	Performance Based Contracting
SOAP	Simple Object Access Protocol
TTL	Time to Live
UTC	Coordinated Universal Time
WS	Weapon System
WSDL	Web Service Definition Language
XML	Extensible Markup Language

10 Document History

Revision Number	Description	Date
1.0	Ready for Navy RFP	10 November 2015