

Electronic Information Environment (EIE)

Service Specification Document/Interface Control Document

Navy Demand Request Report – External
External – In the above context is intended to reflect that this content is for the In-Service Support (ISS) Contractors who have been contracted to participate in an ISS phase of a Weapon System or Platform that the Department of National Defence has acquired.

EIE Project

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1 Introduction

This document establishes an interface between Canada Electronic Data Exchange (EDE) system and the In-Service Support (ISS) Contractor responsible for maintenance of a ship class subject to Performance Based Contracting (PBC). This interface will be used by Canada to send Part Request Report messages to ISS Contractor. To support the Part Request Report 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.

1.1 Intended Audience

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

1.2 References

- | | |
|----------|---|
| [Ref. 1] | Electronic Information Exchange Business Use Case - BUC 3.51 Navy - Exchange Part Request Report Data |
| [Ref. 2] | PBC Business Process Catalogue Annex M: Navy Supply Process Model - In the Context of Performance Based Contracting (PBC) |
| [Ref. 3] | Electronic Information Exchange Service Interaction Model |
| [Ref. 4] | Electronic Information Exchange Materiel Management Service Operational Model – External |

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2 Business Information

Business Information is based on the EIE Business Use Case for Part Request Report Data [Ref. 1].

The Part Request Reporting service is used to satisfy two business processes:

- 1) Reporting of demands which are satisfied by stock on-hand for each relevant storage location.
- 2) Reporting of demands which are not satisfied by stock on-hand for each relevant storage location.

Each of these is satisfied through the technical service, Part Request Report.

The ISS Contractor¹ will be responsible for monitoring the materiel consumption and stock level of the Canada storage locations and maintaining defined stock levels. In order to accurately monitor inventory level and demand satisfaction, CSS will send Inventory Visibility Reports (Inventory Report, Part Request Report, and Usage Report) to the ISS Contractor, via EDE on a scheduled basis.

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 Defence Resource Management Information System (DRMIS).

2.1 Business Processes

On a predetermined schedule, Canada will collect part request satisfaction data identifying which requirements are satisfied, and not satisfied, by stock on-hand for each relevant storage location. The ISS Contractor will use this information to assist in supply performance evaluation.

2.2 Business Triggers

The following actions within Canada CSS/CMMS systems, the business triggers, will result in a Usage data being sent to ISS Contractor.

- On a predetermined schedule, Canada will collect part request satisfaction data identifying which requirements are satisfied, and not satisfied, by stock on-hand for each relevant storage location.

For further information, including cross-references to business processes, please refer to the Business Use Case [Ref. 1].

¹ In this document the terms Industry and ISS Contractor are synonymous. The term ISS Contractor is used during description of the business process to align with the Business Use Cases. The term Industry is used during description of service interactions and service descriptions.

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2.3 Business Error Processing

ISS Contractor will report Business Errors with regards to the data to Canada via the exposed error interfaces, but any resolution may be a manual process.

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3 Business Constraints

Constraints on *Usage* of the Service

- 1) Canada EDE shall ensure a Part Request Report message is only processed for an Industry which is properly authenticated and authorized to see maintenance and materiel data for that ship class.
- 2) Every invocation of a service operation shall be secured using secure credentials such as Public Key Infrastructure (PKI) Certificate.

Constraints on *Behaviour* of the Service

- 3) The Part Request Report service shall operate on a predetermined schedule, nominally once a day per Canada storage location or deployed PUK.
- 4) A Part Request Report message will only represent one Canada storage location or deployed PUK construct.
- 5) A Part Request Report message will address serviceable storage locations only.
- 6) Industry will report any business processing errors through the Part Request Report error operation exposed by Canada EDE using a distinct and separate invocation.
- 7) Part Request Report messages will be signed using digital certificates between Canada EDE and Industry. Please see Service Interaction Model [Ref. 3] for details.
- 8) 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. 3] for details.

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4 Service Use Case

The requirements for the Part Request Report service are defined by one use case with several scenarios.

4.1 Service Context ²

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.

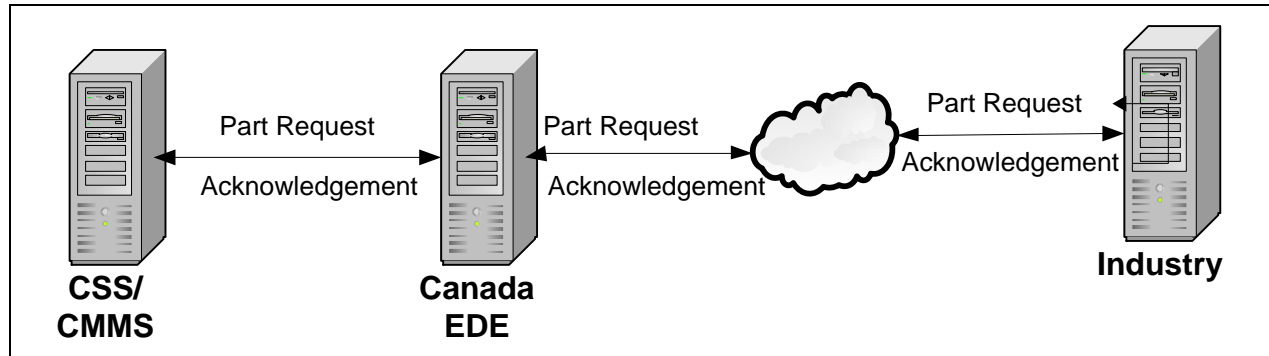


Figure 4-1 Part Request Report Service Context

The following steps occur:

- CSS/CMMS will periodically collect part request information.
- CSS/CMMS send Part Request Report message to Canada EDE – Canada EDE accepts the message and returns a ‘technical’ response.
- Canada EDE sends Part Request Report message to Industry – Industry accepts the message and returns a ‘technical’ response.
- Industry backend system performs the required processing including enforcement of pre-established business rules as per agreement with Canada and Industry.

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.

4.2 Successful Request and Technical Response

The Part Request Report Message Flow is shown in Figure 4-2. This is the main or “Happy Day” scenario.

² The terms ISS Contractor and Industry are used interchangeably in this document.

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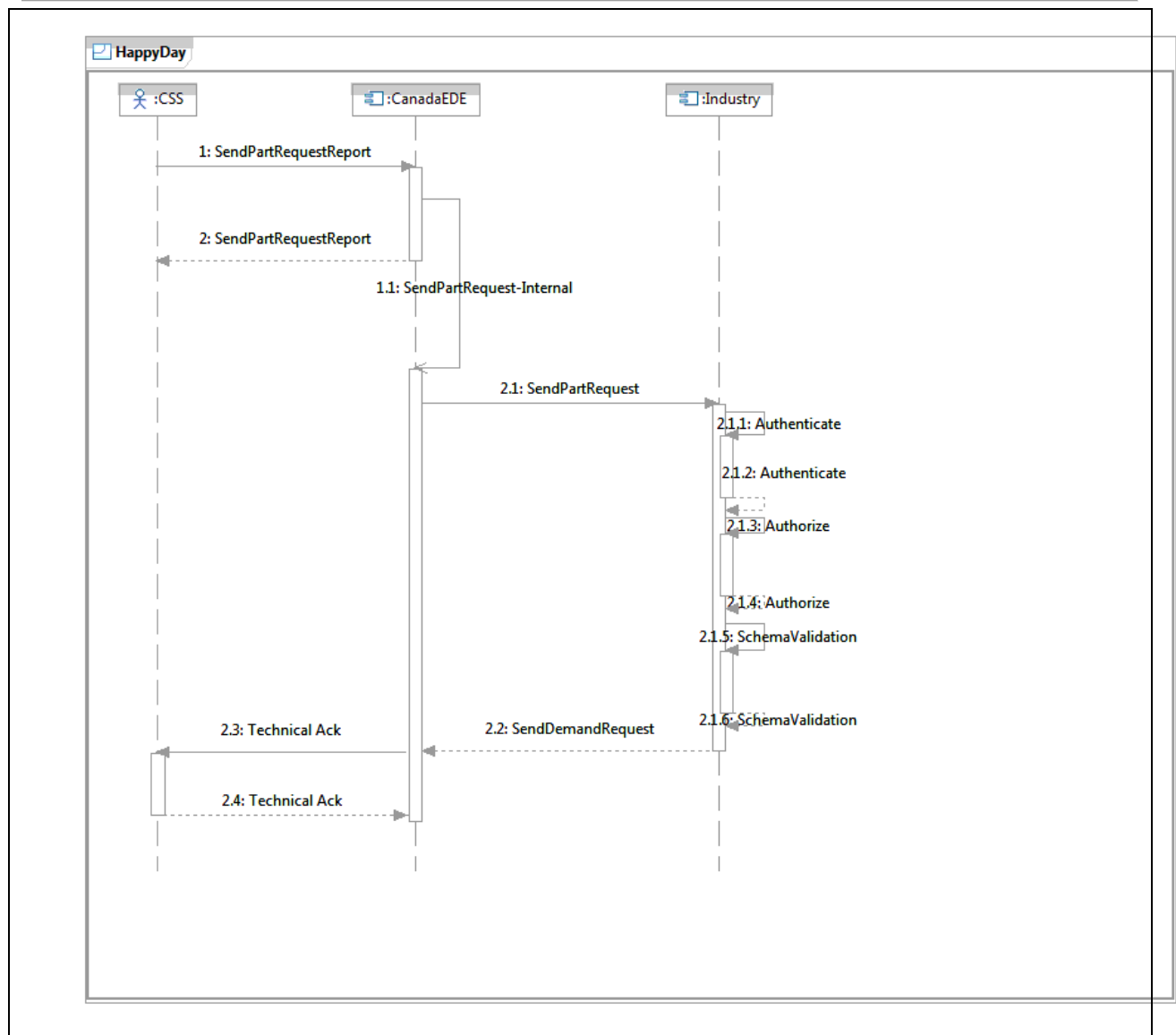


Figure 4-2 Part Request Report Message Flow

Main Flow	
Scenario	“Happy Day:” Canada EDE successfully sends Part Request Report message to Industry.
Pre-Condition	CSS has collected materiel usage data.
Post-Condition	Part Request Report message is successfully received by Industry. CSS is advised of successful delivery of message to Industry.

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Steps	1) CSS sends Part Request Report message to Canada EDE. 2) Canada EDE successfully Authenticates, Authorizes and Validates the message; then starts an internal process. 3) Canada EDE responds that the message has been accepted. 4) The Canada EDE system invokes the Industry hosted and exposed SendPartRequest operation. 5/6) Industry successfully Authenticates the service consumer. 7/8) Industry successfully Authorizes use of the service/operation. 9/10) Industry conducts the required validations as per Service Interaction Model [Ref. 3]- Section Technical Delivery Phase 11) Industry provides technical response to Canada EDE. The response may indicate a status of Success or contain a fault. 12/13) Canada EDE sends <i>Technical Acknowledgement</i> to CSS
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Implicit in the above diagram is that a service Consumer may re-try to send a message to the service Provider in the event there is no technical response from the Provider or if the Provider response indicates a technical error. Resend behaviour is governed by parameters in the non-functional requirements of each operation.

4.3 Alternate Scenarios

The following scenarios apply to all uses of the Part Request Report service.

Alternate Flow 1 (Authentication Failure)	
Scenario	Canada EDE does not provide appropriate credentials to Industry.
Pre-Condition	Canada EDE has invoked the Industry Part Request Report Service.
Post-Condition	The Industry sends an Authentication Failure fault response
Steps	1) The authentication credentials are either not provided or are incorrect. 2) The Industry sends an Authentication Failure fault as the technical response. 3) Canada EDE processes the fault.
Alternate Flow 2 (Authorization Failure)	
Scenario	Canada EDE is not authorized to use a service.
Pre-Condition	Canada EDE has invoked the Industry Part Request Report Service. Industry has completed Authentication successfully.
Post-Condition	The Industry sends an Unauthorized Request fault as the technical response.

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Steps	<ol style="list-style-type: none"> 1) The request message does not pass Industry authorization. 2) The Industry sends an Unauthorized Request fault as the technical response. 3) Canada EDE processes the authorization failure.
Alternate Flow 3 (Message Technical Validation Failure)	
Scenario	Canada EDE sends a malformed message to Industry.
Pre-Condition	Canada EDE has invoked the Industry Part Request Report Service. Industry has completed Authentication and Authorization successfully.
Post-Condition	The Industry sends a Malformed Message fault response.
Steps	<ol style="list-style-type: none"> 1) The message does not pass validation as per agreed schema. (Regardless of the number and types of errors). 2) Industry sends schema validation error information as the technical response as the fault message as defined within the exposed interface. 3) Canada EDE processes the schema validation error.
Alternate Flow 4 (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 Part Request Report service.
Post-Condition	Canada EDE marks the message as Dead Message.
Steps	<ol style="list-style-type: none"> 1) Canada EDE does not receive any technical response from Industry within the allowed ACK_TIME_INTERVAL. 2) Canada EDE will retry sending the message up to the defined maximum retry count, or Time to Live interval, whichever comes first. <p>If there is no response, then Canada EDE marks the request message as Dead and handles it via the DeadMessageHandlerService.</p>

The Part Request Report Business Validation Failure Message Flow is shown in Figure 4-3.

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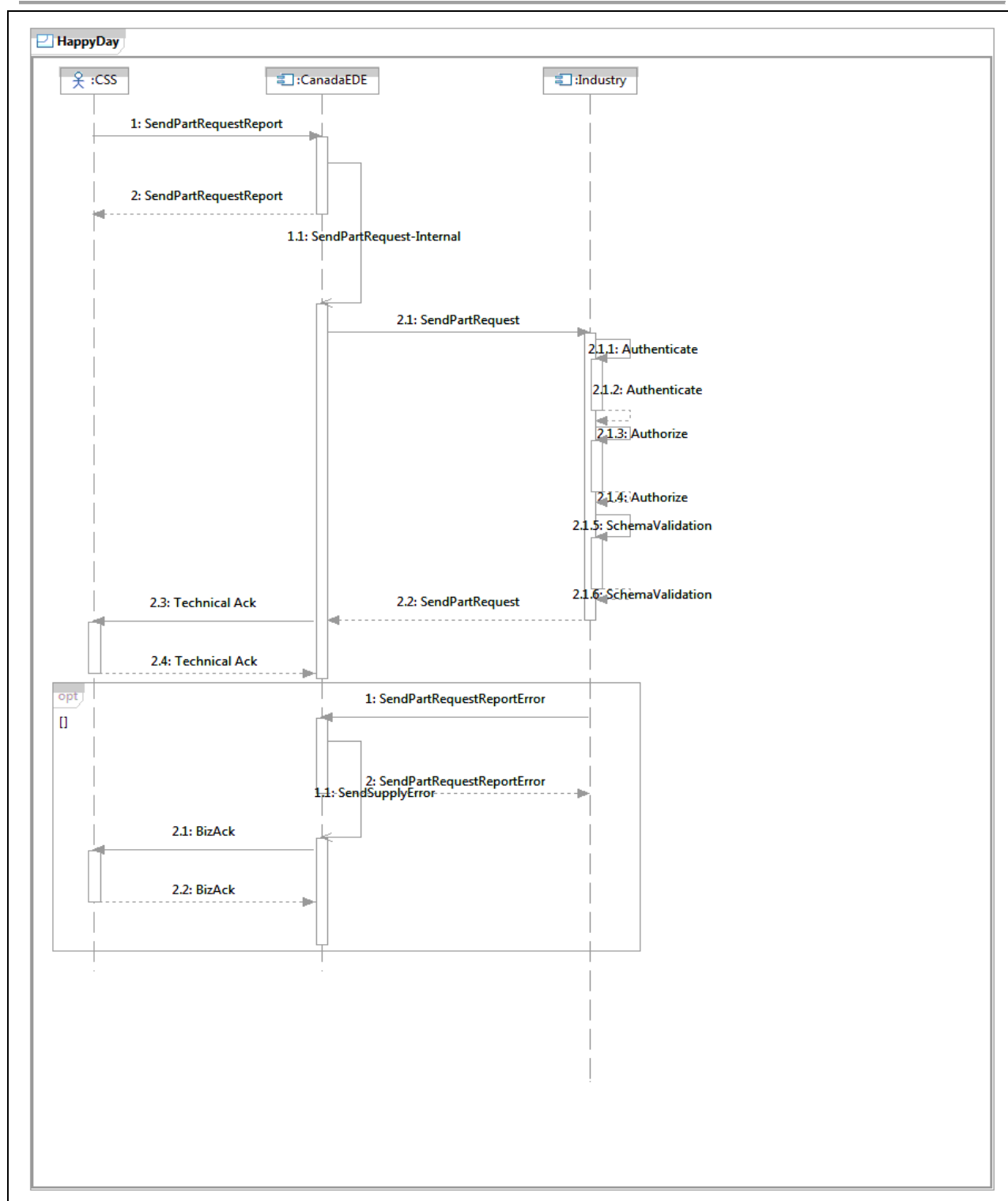


Figure 4-3 Part Request Report Business Validation Failure Message Flow

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Alternate Flow 5 (Business Validation Failure)	
Scenario	Industry business validations fail on one or more Part Request Report data records.
Pre-Condition	Canada EDE has invoked the Industry Part Request Report service, the message has passed Authentication, Authorization and Schema Validation and a successful technical response has been received by Canada EDE.
Post-Condition	Industry sends error information to Canada EDE.
Steps	<ol style="list-style-type: none">1) The Usage data records failed Industry's business validation process.2) Industry sends business error information to Canada using the Part Request Report Error operation.

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5 Service Description – Part Request Report Service

5.1 Service Overview

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

Canada EDE will provide a Part Request Report Error operation to be used by Industry to report a Technical or Business Fault if errors are found during Industry processing. See [Ref. 4].

5.2 Service Properties

Service Property	Description
Enterprise Service Name (Business)	Part Request Report Service
Enterprise Service Name (Technical)	PartRequestReport_Industry PartRequestReport_Canada
Purpose	<p>This service supports the Canada EDE Maintenance process for scheduled and unscheduled maintenance tasks. On a periodic basis, Canada uses this service to send parts Usage messages to Industry for a location or deployed PUK.</p> <p>This service also supports reporting of business errors encountered while processing Part Request Report messages within the Industry system.</p>
Business Response Time Interval	N/A
Service Domain	Supply Management
Business Owner	ADM (IM)
Service Grouping	Supply Materiel / Part Request Report
Source Provider	Industry
Target Service Consumers	Canada EDE
Business Process Supported (now)	Perform 1st and 2nd level maintenance <ul style="list-style-type: none">Execute Corrective or Preventive Maintenance
Business Process Supported (future)	None currently identified.
Business Objective Supported	See Section 2: Business Information .

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Service Property	Description
Expected life time	The full lifecycle of the subject weapons system using ISSCF.

5.3 Service Operations

Provider	Consumer	Operation
Industry	Canada EDE	SendPartRequestReport
Canada EDE	Industry	SendPartRequestReportError

5.3.1 SendPartRequestReport Operation

This operation is used by Canada EDE to send a Part Request Report message to Industry. Industry's implementation of this operation will perform authentication, authorization and technical message validation on the Part Request Report message. Industry will return a status or fault information to the consumer.

If Industry accepts the message for further processing an output message is returned. The content of the output indicates SUCCESS, Industry accepts custody of the message for further processing. If Industry does NOT accept the message, Industry will return one or more fault blocks.

5.3.2 SendPartRequestReportError Operation

This operation is used by Industry to send a Part Request Report Error message to Canada EDE in the event a business error is encountered by Industry backend system. Canada EDE's implementation of this operation will perform authentication, authorization and technical message validation on the Part Request Report Error message. Canada EDE will return a status or fault information to the consumer.

If Canada EDE accepts the message for further processing an output message is returned. The content of the output indicates SUCCESS, Canada EDE accepts custody of the error message for further processing. If Canada EDE does NOT accept the message, Canada EDE will return one or more fault blocks.

5.4 Message Interaction

As defined in [Section 4: Service Use Case](#), the Part Request Report service supports a business-asynchronous interaction with a message-passing paradigm. Each Web Service operation must be defined such that the messages required by the system use case (faults in particular, see Section 4.3 Alternate Scenarios) are explicit in the Web Service definition. This implies each Part Request Report web service operation must be defined with an input, output and fault element.

Message interaction is further described in Electronic Information Exchange Service Interaction Model [Ref. 3].

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6 Information Model

This section describes the **business objects** which are used in the Part Request Report service. The Unified Modeling Language (UML) notation is used. A functional view of the information model is provided in the Usage Business Use Case [Ref. 1], Section 3: Functional Data Definition and an Entity-Relationship diagram (ERD) is provided in Appendix A of this document.

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 expressed in an XML Schema.

Note: In the case of the discrepancy between various representations of the information model, the authoritative definition of the information model will always be the XML schema that is defined for the service.

6.1 Part Request Report

A Part Request Report Information Model is shown in Figure 6-1. A Part Request Report message contains a series of transactions identifying demand of parts associated with a specific Canada storage location or deployed PUK, and whether they are satisfied or not.

The Part Request Report (class Mobility Kit Report) is used to report on parts demanded within the specific Canada storage location or PUK. A Part Request Report contains one or more part requests (class PartRequest).

PartRequest is for a particular part (class PartType) and Quantity (QuantityRequired) in a Canada storage location or PUK. If Quantity available in the storage location or PUK, it will be reflected in QuantityCommitted and ReservationNumber.

The field descriptions are elaborated in the Functional view (please see Business Use Case [Ref. 1]).

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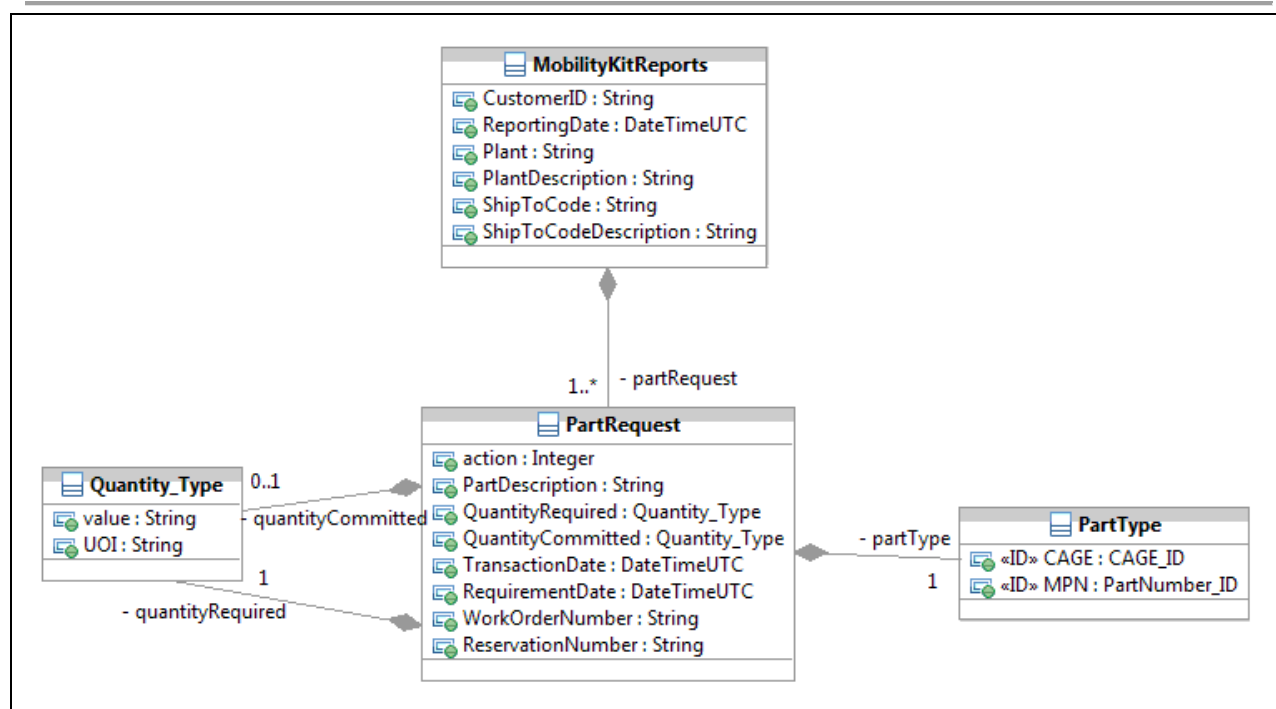


Figure 6-1 Information Model –Part Request Report

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7 Operation Message Model

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

All EIE Supply services are request/response and each operation definition includes a distinct input, output and fault message. Message definitions use a common supply message header definition, as well as a common security block definition. Please refer to Electronic Information Exchange Service Interaction Model [Ref. 3] for details on message header and security block definition.

7.1 Part Request Report Input Message Constructs

7.1.1 Part Request Report Input Body

As shown in Figure 7-1, a Part Request Report input message consists of

- A Message Header;
- A Security Block;
- A Part Request Report (with contained PartRequest).

In order to uniquely identify data from a business payload, certain elements will be identified as elements that can make up the unique Business identifier for each business object that has been transmitted. These elements will then be used by either the consumer or provider to report any errors associated with the contained business payload.

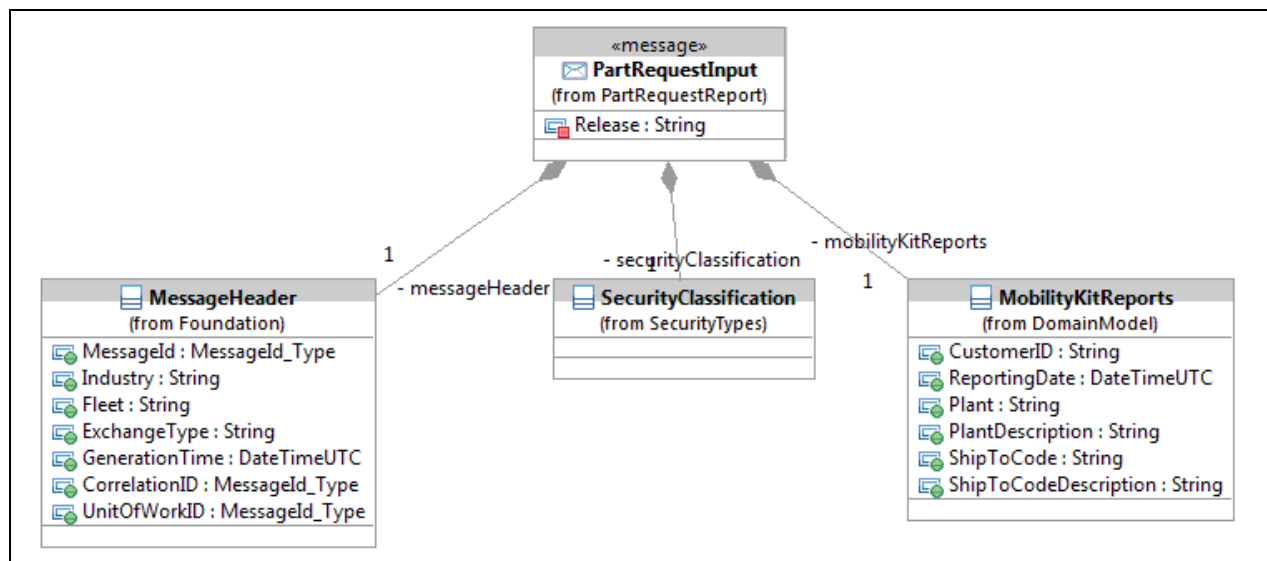


Figure 7-1 Part Request Report Input Message

For a PartRequestReportInputMessage the MessageHeader Correlation ID and UnitOfWorkID are not used.

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7.1.2 Part Request Report Output Body

The output of the SendPartRequestReport operation is the PartRequestReportOutputBody. As shown in Figure 7-2, the output body consists of:

- A Message Header;
- A PartRequestOutput indicating acceptance; the Part Request Report message is accepted in its entirety only.

The output message has no security block. The output does not contain any sensitive or protected information.

This output body definition is also used in the Part Request Report Error service.

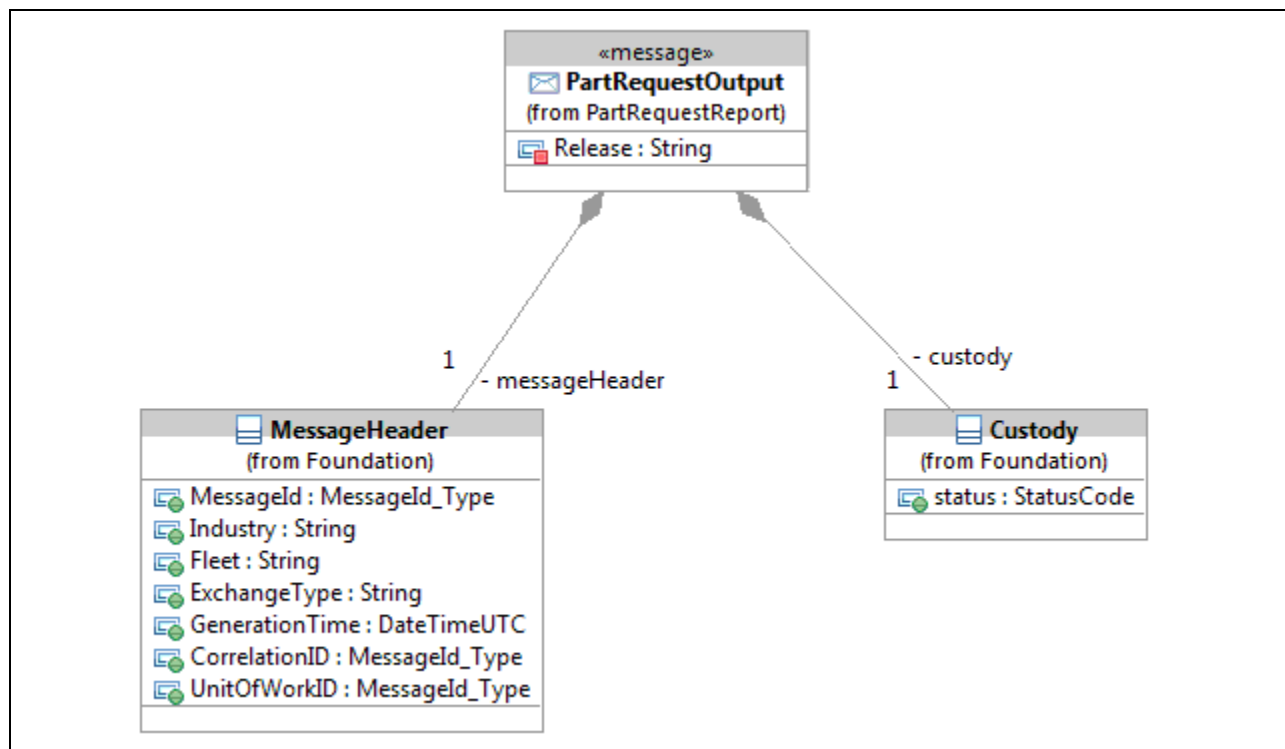


Figure 7-2 Part Request Report Output Message

For a PartRequestReportOutputBody:

- The MessageHeader Correlation ID will reflect the Message ID of the originating Part Request Report input message.
- The MessageHeader Exchange Type must be set to the Exchange Type of the PartRequestReportInputBody.
- The value of the PartRequestOutput 'Custody' evaluates to "success".

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7.1.3 Part Request Report Fault Body

A fault returned by the SendPartRequestReport operation uses the PartRequestReportFaultBody element. As shown in Figure 7-3, the fault message 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.

This fault body definition is also used in the Part Request Report Error service.

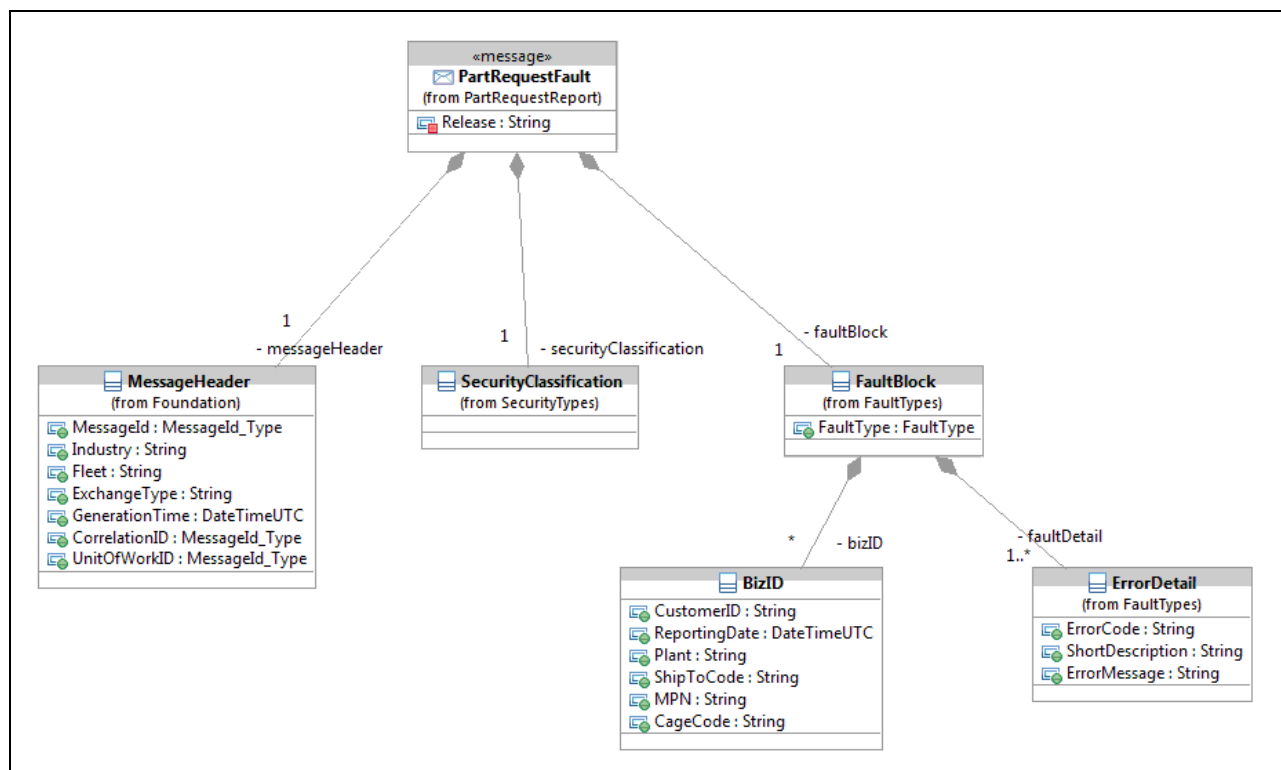


Figure 7-3 Part Request Report Fault Message

For a PartRequestReportFaultMessage:

- The MessageHeader Correlation ID will reflect the Message ID of the originating Part Request Report input message.
- The MessageHeader Exchange Type must be set to the Exchange Type of the PartRequestReportInputBody.

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7.2 Part Request Report Error Message Constructs

In the event Industry encounters a business error while processing the Usage report message in their backend supply system, Industry will send Canada a Part Request Report Error message through the following constructs.

7.2.1 Part Request Report Error Input Body

As shown in Figure 7-4, a Part Request Report Error input message consists of

- A Message Header;
- A Security Block;
- One or more Error body.

Within the Error Body, at least one BizID must be provided, along with at least one ErrorDetail block.

- If appropriate, multiple BizIDs may be provided referencing a common error(s).
- If appropriate, multiple errors can be defined within the error body. These errors would apply to all BizIDs defined within the ErrorBody construct.

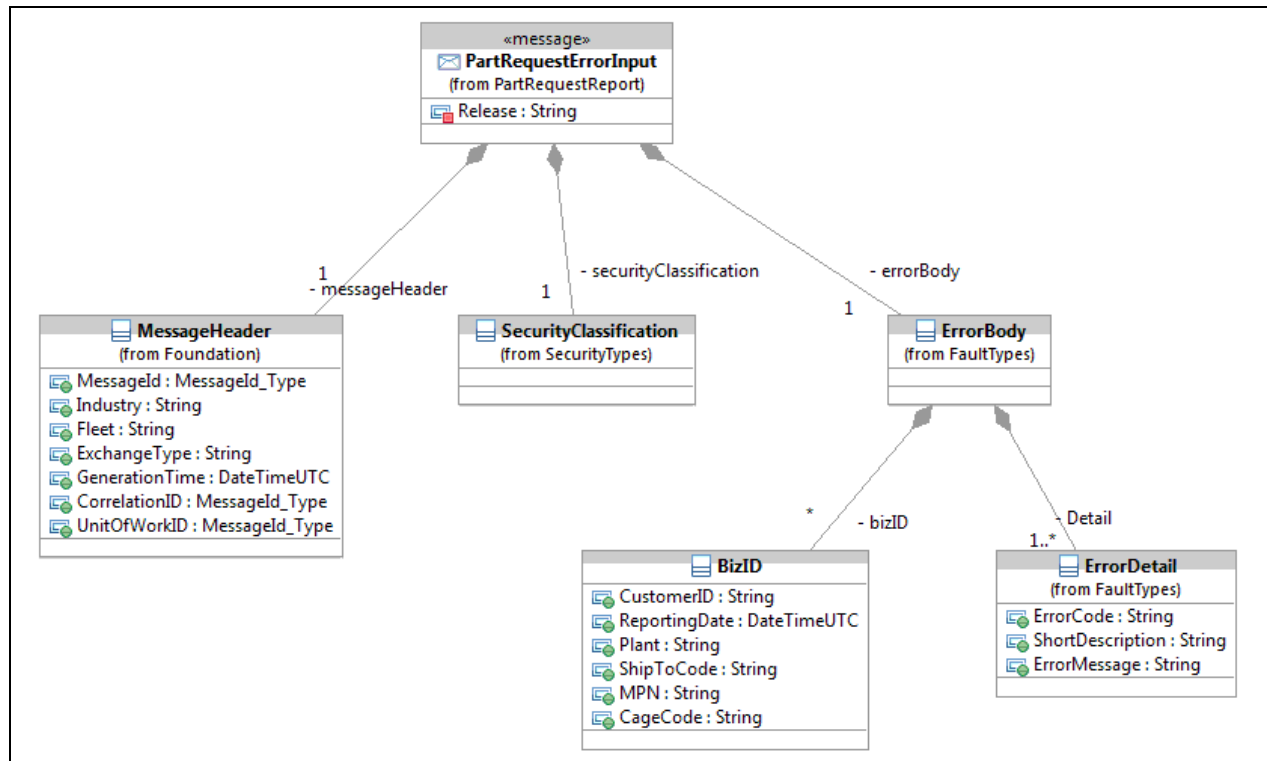


Figure 7-4 Exchange Messages – Part Request Report Error Input Body

For a PartRequestReportErrorInputBody the MessageHeader CorrelationID and UnitofWorkID are not used.

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Each error pertains to one or more business objects, to the level of granularity which the Service Consumer can provide. To report differing errors on more than one business object extra error blocks can be included in the error input message.

7.2.2 Part Request Report Error Output Body

The output of the SendPartRequestReportError operation is the PartRequestReportErrorOutputBody.

Please refer to [7.1.2 Part Request Report Output Body](#) for this definition.

7.2.3 Part Request Report Error Fault Body

A fault returned by the SendPartRequestReportError operation uses the PartRequestReportErrorFaultBody element.

Please refer to [7.1.3 Part Request Report Fault Body](#) for this definition.

8 Service Operation Details

8.1 Detailed Operation Characteristics – SendPartRequestReport

Canada EDE will invoke the exposed Industry Part Request Report service through this operation.

Refer to PartRequestReport_Industry.wsdl for implementation details.

Detailed Operation Characteristics

Interface Definition	Description
Operation Name	Send Part Request Report
Operation Technical Name	SendPartRequestReport
Operation Description	This operation is invoked by Canada to send a part request report record to Industry. The part request report describes parts requested by Canada from a Canada location or PUK, and whether parts were available in the storage location or PUK.
Target Operation Provider	Industry
Target Operation Consumer	Canada
Properties	<i>Request/Response</i> message exchange pattern.
Input Message Definition	Please refer to Operation Message Model Section 7.1.1 Part Request Report Input Body for details.
Output Message Definition	Please refer to Operation Message Model Section 7.1.2 Part Request Report Output Body for details.
Fault Definition	Please refer to Operation Message Model Section 7.1.3 Part Request Report Fault Body for details.

Non Functional Requirements

Non Functional Requirements/Technical Details	
Frequency	Once per day per Canada storage location or deployed PUK
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.
Payload Size	~ 2KB per Usage Line Item
Attachments	None

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Non Functional Requirements/Technical Details	
Attachment Size	N / A
ACK Time Interval	2 minutes
Retry Time Interval	5 minutes
Number of Retries	5
Biz. Response Time Interval	N/A
Time to Live Span	Nominally 1 hour – if message cannot be delivered within 1 hour, await next delivery period in 24 hours.
Service Op Availability	During core processing hours. 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 for this operation when Canada EDE cannot successfully send Part Request Report message to Industry.

8.2 Detailed Operation Characteristics – SendPartRequestReportError

Industry system will invoke the exposed Canada EDE PartRequestReportError service through this operation. A Part Request Report error message will contain Industry-reported business errors encountered while attempting to process a PartRequestReport message generated by Canada.

Refer to PartRequestReport_Canada.wsdl for implementation details.

Detailed Operation Characteristics

Interface Definition	Description
Operation Name	Send Part Request Report Error
Operation Technical Name	SendPartRequestReportError
Operation Description	This operation is invoked by Industry to send a Business Error message to Canada EDE. The Business Error describes errors encountered while processing Canada's Part Request Report message.
Target Operation Provider	Canada EDE

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Interface Definition	Description
Target Operation Consumer	Industry
Properties	<i>Request-Response</i> message exchange pattern.
Input Message Definition	Please refer to Operation Message Model Section 7.2.1 Part Request Report Error Input for details.
Output Message Definition	Please refer to Operation Message Model Section 7.2.2 Part Request Report Error Output for details.
Fault Definition	Please refer to Operation Message Model Section 7.2.3 Part Request Report Error Fault for details.

Non Functional Requirements

Non Functional Requirements/Technical Details	
Frequency	Based on Service Level Agreements (SLA) to be determined between Canada and Industry on a per ship class basis.
Peak Throughput Time	N/A
Peak Throughput Volume	N/A
Payload Size	~ 5KB per Error
Attachments	None
Attachment Size	N/A
ACK Time Interval	2 minutes
Retry Time Interval	5 minutes
Number of Retries	5
Biz. Response Time Interval	N/A
Time to Live Span	Nominally 1 hour – if message cannot be delivered within 1 hour, revert to secondary delivery channel, which may be manual.
Service Op Availability	During core processing hours. 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.

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Non Functional Requirements/Technical Details	
Dead Message Handling	Alternative communication channel applies for this operation when Industry cannot successfully send Part Request Report Error message to Canada.

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 Hyper Text Transfer Protocol (http) transport.

The business objects (Section 6), MessageHeader and SecurityMarkings elements³ are bound to the SOAP Body element. The SOAP Header is used for EIE adopted WS-* standards-based elements (e.g., WS_Security assertions).

In this binding the http response is used for operations' output or fault messages.

8.3.2 SOAP Over JMS

Not currently supported for this service.

³ See the Mobility Kit Usage Service WSDL file for the precise binding

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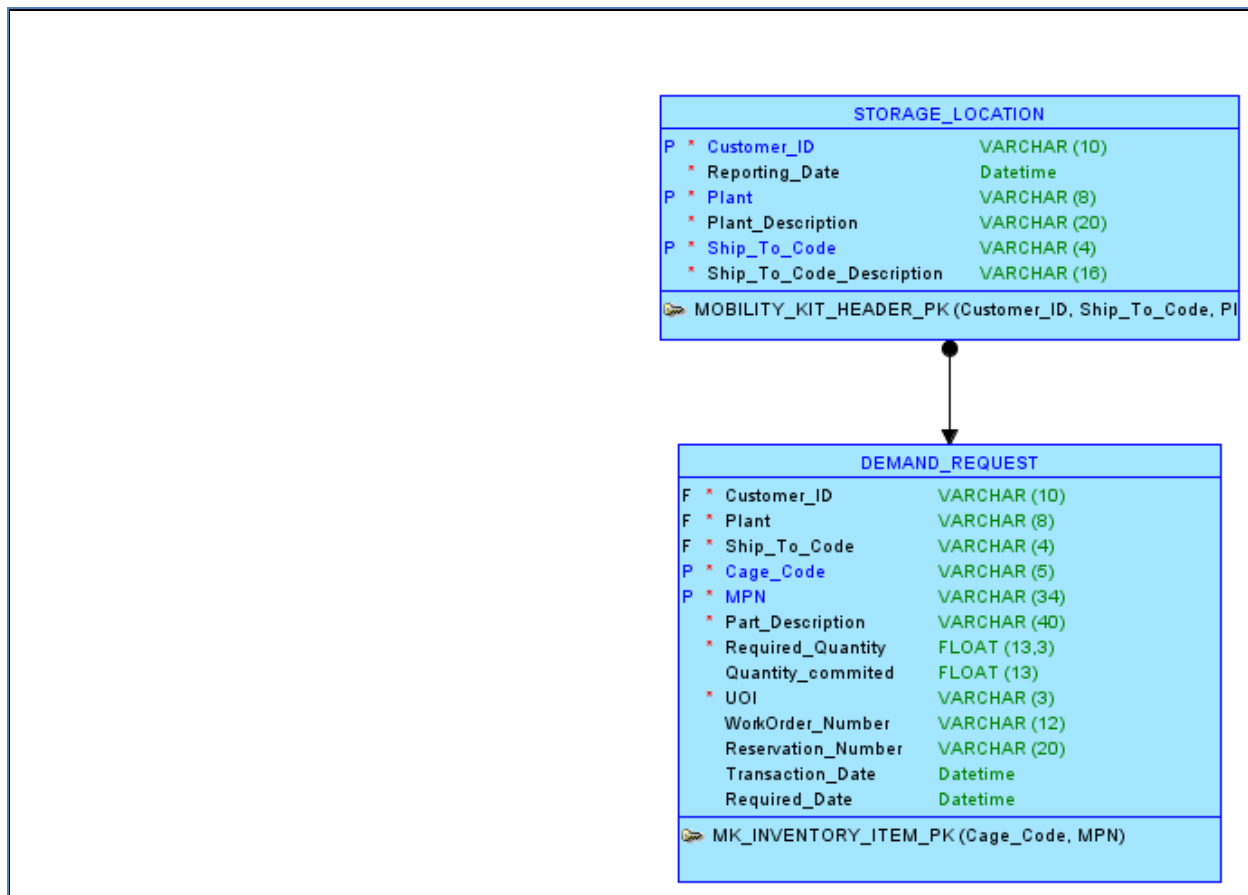
9 Definitions, Acronyms, Abbreviations

Term	Description
ADM (IM)	Assistant Deputy Minister (Information Management)
ADM (Mat)	Assistant Deputy Minister (Materiel)
BUC	Business Use Case
CMMS	Canada Maintenance Management System
CSS	Canada Supply System
DND	Department of National Defence
DRMIS	Defence Resource Management Information System
EDD	Estimated Delivery Date
EDE	Electronic Data Exchange
EIE	Electronic Information Environment
HoP	Hand-Over Point
HTTP	Hyper Text Transfer Protocol
HTTPS	Hyper Text Transfer Protocol Secure
ISS	In-Service Support
JMS	Java Message Service
MP	Maintenance Plan
PO	Purchase Order
SLA	Service Level Agreement
SOAP	Simple Object Access Protocol
STE	Support and Test Equipment
TBD	To Be Defined, To Be Determined
UML	Unified Modeling Language
URL	Uniform Resource Locator
WO	Work Order
WS	Weapon System
WSDL	Web Service Definition Language
XML	Extensible Markup Language
XSD	XML Schema Definition
XSL	Extensible Stylesheet Language

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10 Appendix A – Information Model Entity Relationship View

Information Model – Entity-Relationship View



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11 Document History

Revision Number	Description	Date
1.0	Initial release for Navy RFP.	28 September 2015

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