



Electronic Information Environment (EIE)

Service Specification Document/Interface Control Document

Service Request – 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.

EIE Project

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1 Introduction

This document establishes an interface between the ISS Contractor's systems and Canada Electronic Data Exchange (EDE) system to send service request messages for ship classes subject to Performance Based Contracting (PBC). This interface will be used by Industry to send Service Request messages to Canada EDE. To support the Service Request transfer 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.

1.1 Intended Audience

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

1.2 References

[Ref. 1] Electronic Information Exchange (EIE) Business Use Case - BUC 4_25 Navy Maintenance Service Request Data

[Ref. 2] Annex L: Navy Maintenance Process Model – In the Context of Performance-Based Contracting (PBC)

[Ref. 3] Electronic Information Exchange Service Interaction Model

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2 Business Information

Business Information is based on the EIE Business Process Catalogue for Maintenance [Ref. 2].

The ISS Contractor may request FMF to perform backshop work on any given unserviceable ISS Contractor-owned part. To request backshop work, the ISS Contractor sends a service request transaction to CMMS via the EIE EDE. The CMMS processes the service request and creates a maintenance notification to initiate the backshop work.

The actual backshop maintenance execution tasks are determined based on the task list received from the ISS Contractor. The task list may optionally be specified in the service request or agreed to via non-systematic means. In either case the task list must pre-exist in CMMS. (A task list specifies the details of the task to be completed, i.e. expected duration, skills or trade required, spares, consumables, STE and references to technical documentation and manuals.) If a task list is not specified in the Service Request a user may manually add it to the work order, based on information previously agreed to between Canada and the ISS Contractor.

Within Canada DND 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 DND by the Defence Resource Management Information System (DRMIS).

2.1 Business Processes

To request backshop work, the ISS Contractor sends a service request transaction to CMMS via the EIE EDE. The CMMS will process the service request and verify that (a) the part to be serviced is known to the CMMS system, and (b) the referenced maintenance task list is known to Canada. Upon successful validation, CMMS will create a maintenance notification to initiate the back-shop work.

2.2 Business Triggers

The following actions within the ISS Contractor systems, the business triggers, will result in Service Request data being sent to Canada.

- the ISS Contractor needs to request Canada perform back-shop repair/overhaul of a part associated with the respective PBC weapon system (WS).

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

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2.3 Business Error Processing

In the event Canada encounters business errors while attempting to post Service Request data to their backend systems, Canada will report errors on all line items within a Service Request message in one error message.

Where possible, the ISS Contractor will correct the data based upon reported errors, and generate a new Service Request message.

In the event the Service Request references a part unknown to Canada, or references a task list unknown to Canada, the ISS Contractor must send information on the part or task list to Canada through the master data load service prior to re-sending the Service Request message¹.

¹ Note that implementing data into CMMS from through the master data load process is a complex process that may take many days to complete. In this scenario the Service Request cannot be successfully ingested until this master data load process completes.

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3 Business Constraints

Constraints on *Usage of the Service*

- 1) Canada EDE shall ensure a Service Request message is only processed from an Industry partner which is properly authenticated and authorized to see maintenance and materiel data for that fleet.
- 2) Every invocation of a service operation shall be secured using secure credentials such as PKI Certificate.

Constraints on *Behaviour of the Service*

- 3) The Service Request service shall operate in near-real time.
- 4) Canada will authorize invocations of operations of the Service Request service
- 5) Canada EDE will report any business processing errors through the Service Request Error operation.
- 6) Service Request messages will be signed using digital certificates between Canada EDE and Industry. Please see Service Interaction Model [Ref. 3] for details.
- 7) Industry 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 Service Request 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.

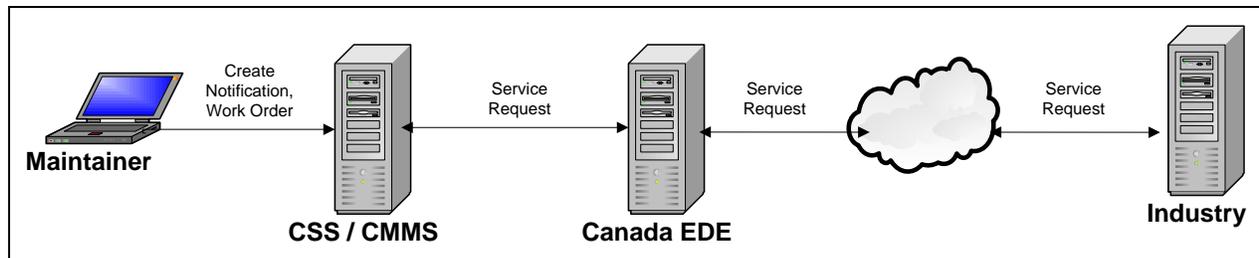


Figure 4-1 Service Request Service Context

The following steps occur:

1. Industry² determines a part is to be repaired or overhauled by Canada back-shop.
2. Industry generates a Service Request message.
3. Industry sends Service Request to Canada EDE – Canada EDE accepts the message and returns a ‘technical’ response.
4. Canada EDE sends Service Request to CSS – CSS accepts the message and returns a ‘technical’ response.
5. CSS performs the required “back-end” processing including enforcement of pre-established business rules as per agreement with Canada- and Industry, and generates a Notification and Work Order.

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 being observed by Canada and reported back to Industry as required.

4.2 Successful Request and Technical Response

Figure 4-2 presents the main or “Happy Day” scenario.

² In the context of this document, the term ‘Industry’ is used to generically denote the ISS Contractor

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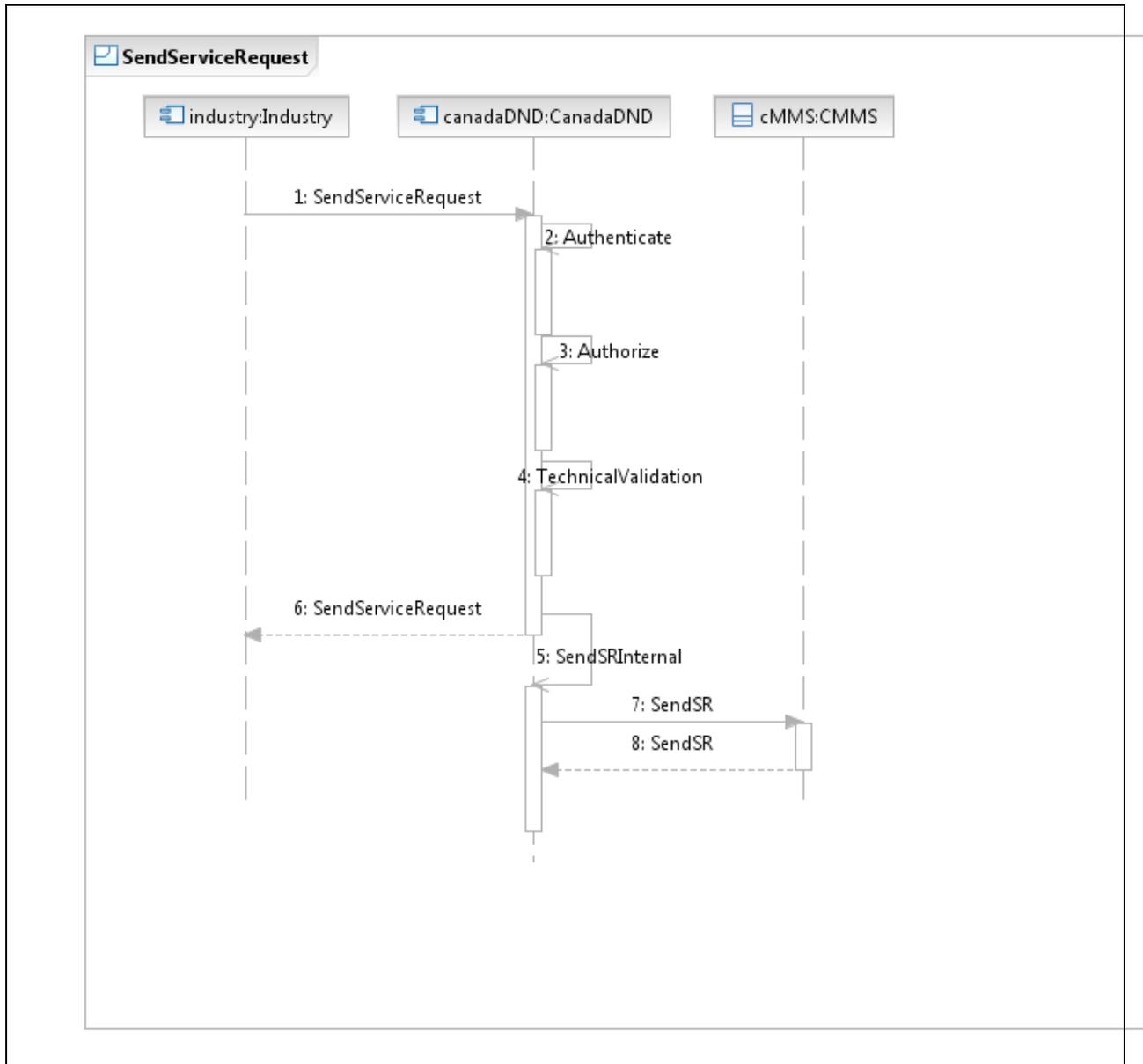


Figure 4-2 Service Request Message Flow

Main Flow	
Scenario	“Happy Day:” Industry successfully sends Service Request to Canada.
Pre-Condition	Industry determines a part is to be repaired or overhauled by Canada back-shop.
Post-Condition	Service Request message is successfully received by Canada.

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Main Flow	
Steps	<ol style="list-style-type: none"> 1) Industry sends Service Request message to Canada EDE. 2) Canada EDE successfully Authenticates the service consumer. 3) Canada EDE successfully Authorizes the service consumer. 4) Canada EDE conducts the required validations 6) Canada EDE sends technical response to Industry indicating message was accepted. 5/7/8) Canada EDE invokes back-end processing in CSS.

Implicit in the above diagram is that a service Consumer may retry 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 Service Request service. The Service Request Acknowledgement or Business Validation Failure Message Flow is shown in Figure 4-3.

Alternate Flow 1 (Authentication Failure)	
Scenario	Industry does not provide appropriate credentials to Canada EDE.
Pre-Condition	Industry has invoked the Canada EDE Service Request Service.
Post-Condition	Canada EDE sends an Authentication Failure fault response
Steps	<ol style="list-style-type: none"> 1) The authentication credentials are either not provided or are incorrect. 2) Canada EDE sends an Authentication Failure fault as the technical response. 3) Industry processes the error.
Alternate Flow 2 (Authorization Failure)	
Scenario	Industry is not authorized to use a service.
Pre-Condition	Industry has invoked the Canada EDE Service Request Service. Canada EDE has completed Authentication successfully.
Post-Condition	Canada EDE sends an Unauthorized Request fault response.
Steps	<ol style="list-style-type: none"> 1) The request message does not pass Canada EDE authorization. 2) Canada EDE sends an Unauthorized Request fault as the technical response. 3) Industry processes the error.
Alternate Flow 3 (Message Technical Validation Failure)	
Scenario	Industry sends a malformed message to Canada EDE.

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Pre-Condition	Industry has invoked the Canada EDE Service Request Service. Canada EDE has completed Authentication and Authorization successfully.
Post-Condition	Canada EDE 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) Canada EDE sends Malformed Message error information as the technical response as the fault message as defined within the exposed interface.3) Industry processes the message technical validation error.
Alternate Flow 4 (Canada EDE Service unresponsive)	
Scenario	Industry does not receive technical response within ACK_TIME_INTERVAL.
Pre-Condition	Industry has invoked the operation but does not receive the technical response within the time specified for the Service Request service.
Post-Condition	Industry marks the message as Dead Message.
Steps	<ol style="list-style-type: none">1) Industry does not receive any response from Canada EDE within the allowed ACK_TIME_INTERVAL.2) Industry will retry sending the message up to the defined maximum retry count and/or Time to Live interval.3) If there is no response, then Industry marks the request message as Dead and handles it via the Dead Message Handler Service.

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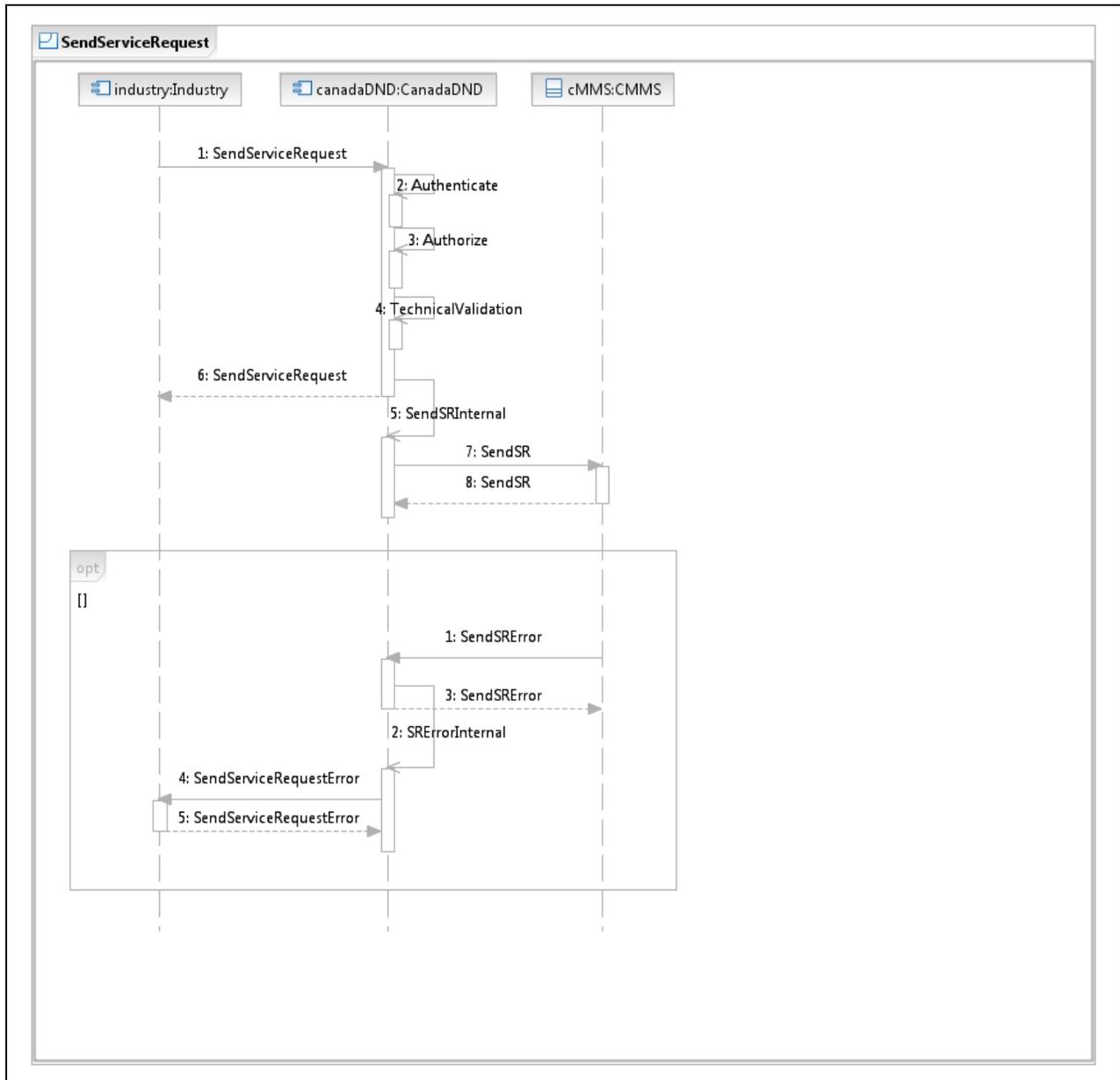


Figure 4-3 Service Request Acknowledgement or Business Validation Failure Message Flow

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Alternate Flow 5 (Business Validation Failure)	
Scenario	CSS business validations fail on the Service Request data record.
Pre-Condition	Industry has invoked the Canada EDE Service Request service, the message has passed Authentication, Authorization and message technical Validation and a successful technical response has been received by Industry.
Post-Condition	Canada EDE sends error information to Industry.
Steps	<ol style="list-style-type: none">1) The Service Request data record failed CSS's business validation process.2) Canada EDE sends business error information to Industry via the Service Request Error operation exposed by Industry.3) Industry Authenticates, Authorizes and performs Technical Validation on Service Request Error message.4) Industry returns a "technical" ack to Canada EDE.

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5 Service Description – Service Request Service

5.1 Service Overview

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

Industry will provide a Service Request Error operation to be used by Canada EDE to report a Technical or Business Fault if errors are found during Canada internal processing post initial technical acknowledgement of the Service Request message.

5.2 Service Properties

Service Property	Description
Enterprise Service Name (Business)	Service Request Service
Enterprise Service Name (Technical)	IndustryServiceRequestService
Purpose	This service supports the Canada Navy Maintenance process for back-shop maintenance tasks for PBC. On the occurrence of business triggers, Industry uses this service to send Service Request messages to Canada EDE on a near-real time basis.
Business Response Time Interval	N/A
Service Domain	Maintain Platform
Business Owner	ADM (IM)
Service Grouping	Maintain Platform – back-shop
Source Provider	Service Request – Canada Service Request Error – Industry
Target Service Consumers	Service Request – Industry Service Request Error – Canada
Business Process Supported (now)	Perform maintenance <ul style="list-style-type: none"> • Back-shop 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
Canada EDE	Industry	SendServiceRequest
Industry	Canada EDE	SendServiceRequestError

5.3.1 SendServiceRequest Operation

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

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

5.3.2 SendServiceRequestError Operation

This operation is used by Canada to send a Service Request Error message to Industry in the event a business error is encountered by Canada backend supply system. Industry’s implementation of this operation will perform authentication, authorization and technical validation on the Service Request Error 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 error message for further processing. If Industry does NOT accept the message, Industry will return one or more fault blocks. Irrespective of outcome, if Canada reports a business error through this service, no further processing of the originating Service Request message takes place.

5.4 Message Interaction

As defined in [Section 4: Service Use Case](#), the Service Request 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 Service Request 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 Service Request service. The Unified Modeling Language (UML) notation is used. A functional view³ of the information model is provided in the Service Request Business Use Case [Ref. 1], Functional Data Definition, and an Entity-Relationship diagram (ERD) is provided in Annex 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: The only authoritative source for purpose of the information exchange will be the specific XML Schema for the business object.

6.1 Service Request

The Service Request information model is shown in Figure 6-1 below.

The Service Request must include the following information:

- Customer ID
- Service Request Number
- MPN/Cage of part to be maintained.

In addition, if the part is serialized, the Serial Number must be present. If a task list is defined, the Task List Number must also be present

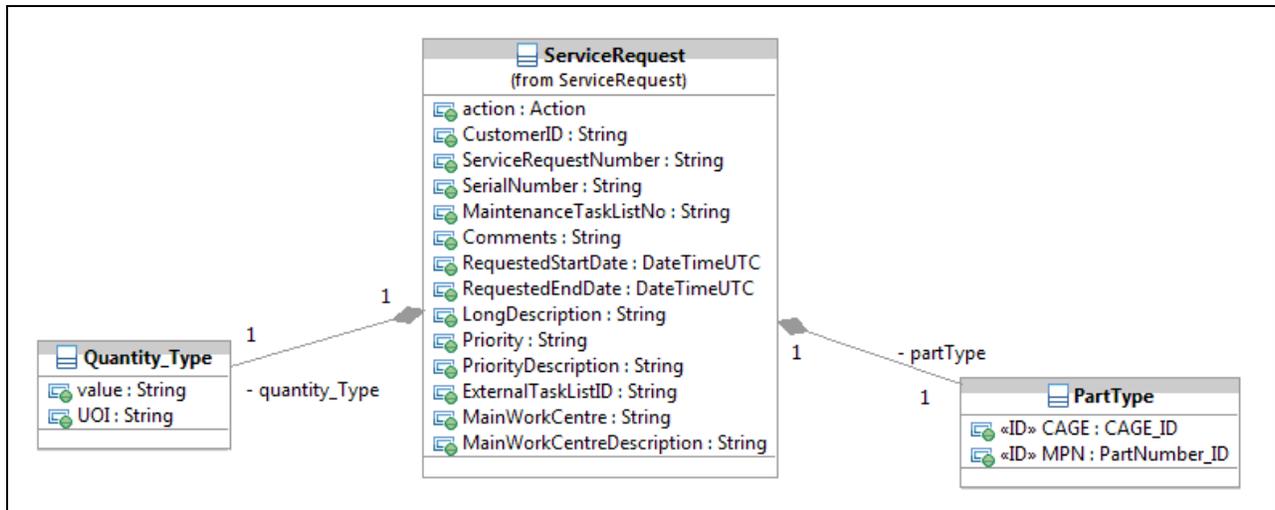


Figure 6-1 Information Model –Service Request

The ‘action’ attribute is discussed in [Section 7.1.1 Service Request Input Body](#).

³ The Functional View details the collection of fields which make up a service request.

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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 [Ref. 3] Electronic Information Exchange Service Interaction Model for details on message header and security block definition.

7.1 Service Request Message Constructs

7.1.1 Service Request Input Body

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

- a Message Header;
- a Security Block;
- a Service Request.

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 with associated with the contained business payload.

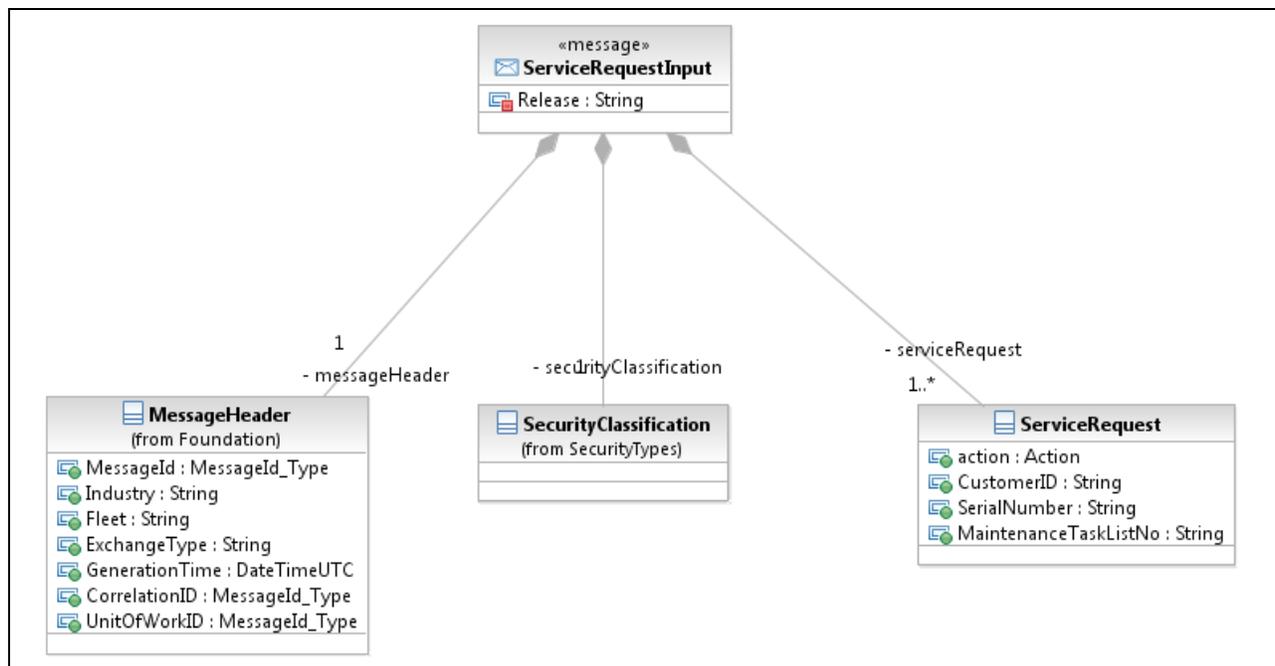


Figure 7-1 Service Request Message

For a ServiceRequest InputBody the MessageHeader Correlation ID and Unit of Work ID are not used.

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Within the Service Request business object there is an attribute named 'action' which is set by the service consumer as a directive to CSS on handling the business object. Valid values for 'action' are:

- Create a new business object: action = 1;
- Edit an existing business object: action = 2;
- Delete a business object: action = 3.

7.1.2 Service Request Output Message

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

- a Message Header;
- a CustodyOutput indicating acceptance; the Service Request 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 common across all Service Request operations.

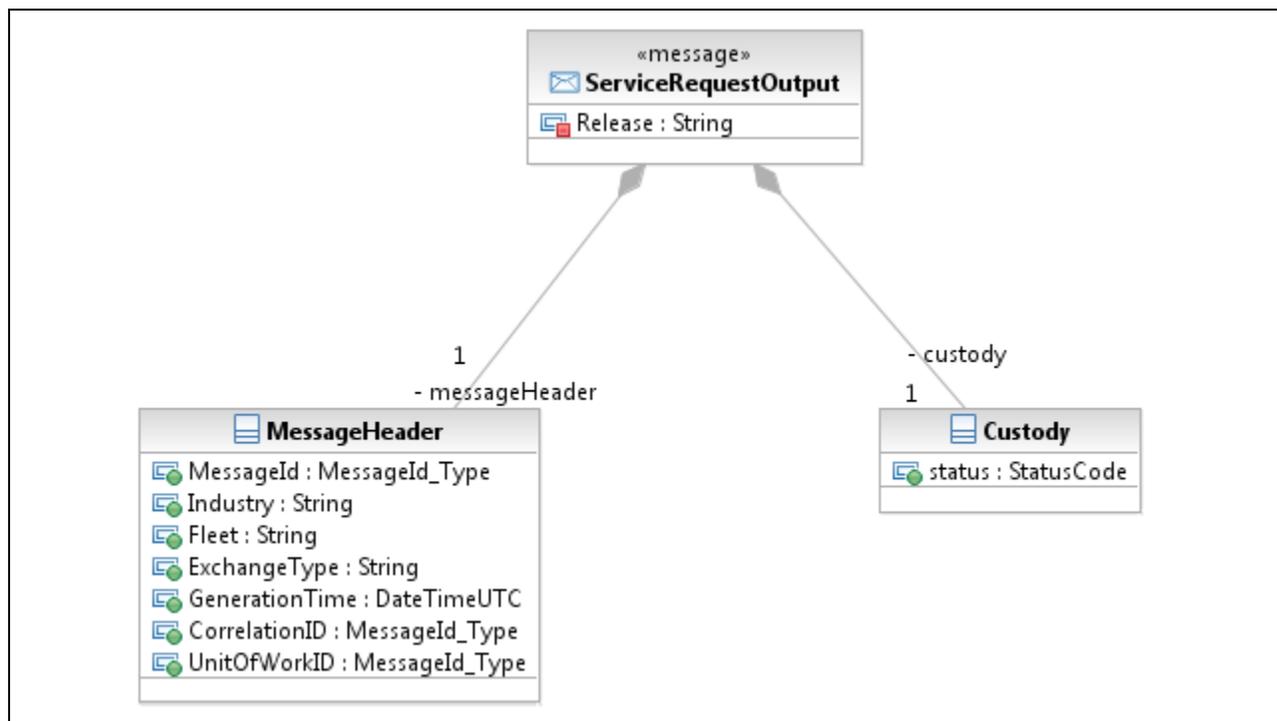


Figure 7-2 Service Request Output Message

For a ServiceRequestOutputBody:

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- The MessageHeader Correlation ID will reflect the Message ID of the originating Service Request input message;
- UnitofWorkID is not used;
- The MessageHeader Exchange Type must be set to the Exchange Type of the ServiceRequestInputBody;
- The value of the CustodyOutput 'status' evaluates to "success".

7.1.3 Service Request Fault Messages

A fault returned by the SendServiceRequest operation uses the ServiceRequestFaultBody element. As shown in Figure 7-3, the fault body consists of:

- A Message Header;
- A Security Block;
- One or more FaultBlock's.

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 used common all Service Request operations.

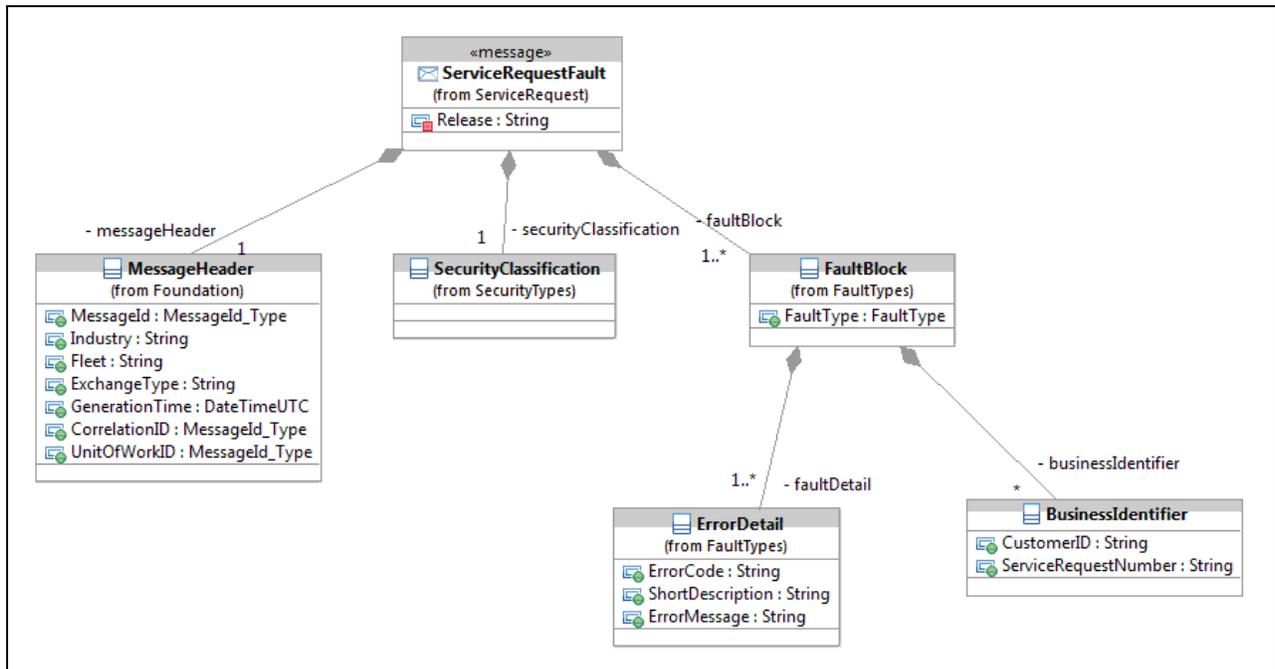


Figure 7-3 Service Request Fault Body

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For a ServiceRequestFaultMessage:

- The MessageHeader Correlation ID will reflect the Message ID of the originating Service Request input message.
- UnitofWorkID is not used;
- The MessageHeader Exchange Type must be set to the Exchange Type of the ServiceRequestInputBody.

7.2 Service Request Error Message Constructs

In the event Canada encounters a business error while processing the service request in their backend supply system, Canada will send Industry a Service Request Error message through the following constructs.

7.2.1 Service Request Error Input Body

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

- A Message Header;
- A Security Block;
- An Error Body.

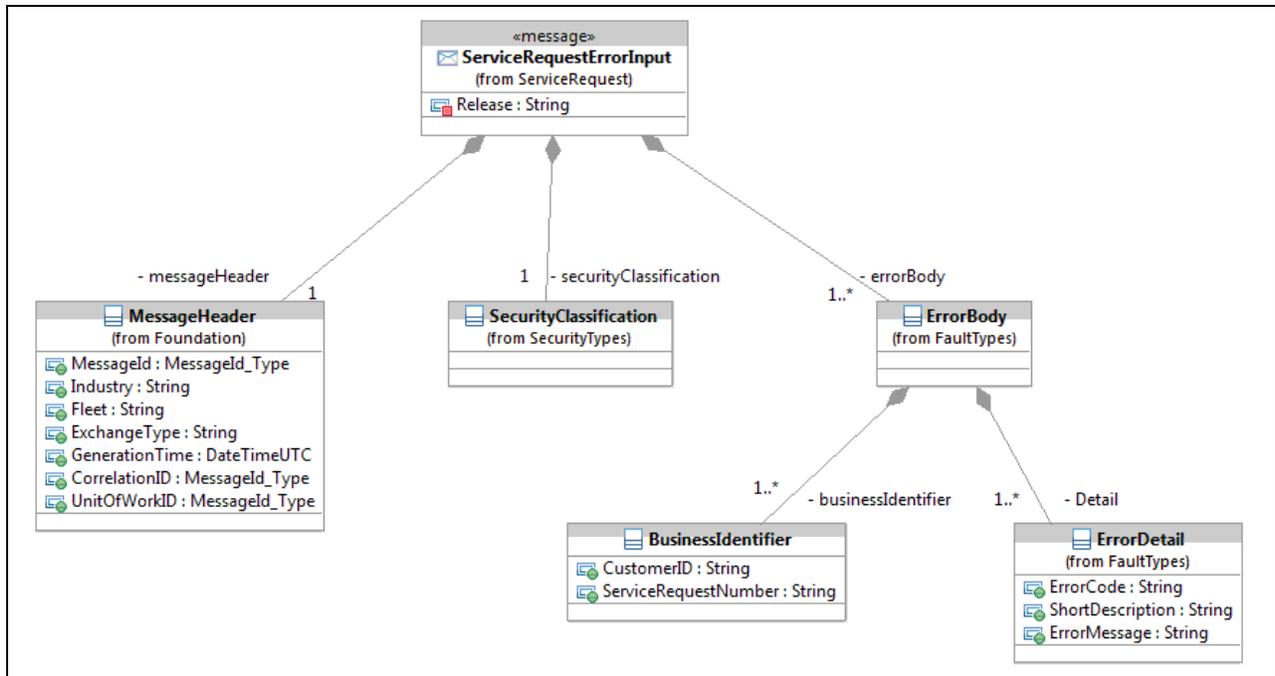


Figure 7-4 Exchange Messages – Service Request Error Input Body

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For a ServiceRequestError InputBody the MessageHeader CorrelationID and UnitofWorkID are not used.

The fault body 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 BizID's defined within the ErrorBody construct.

Each error pertains to one or more business objects, to the level of granularity which the Service Provider 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 Service Request Error Output Body

Please refer to [7.1.2 Service Request Output Message](#) for this definition.

7.2.3 Service Request Error Fault Body

Please refer to [7.1.3 Service Request Fault Messages](#) for this definition.

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8 Service Operation Details

8.1 Detailed Operation Characteristics – SendServiceRequest

Industry will invoke the exposed Canada EDE Service Request service through this operation. A Service Request message will contain a service request demand.

Refer to ServiceRequest_Canada.wsdl for implementation specifications.

Detailed Operation Characteristics

Interface Definition	Description
Operation Name	Send Service Request
Operation Technical Name	SendServiceRequest
Operation Description	This operation is invoked by Industry to send a Service Request record to Canada EDE.
Target Operation Provider	Canada EDE
Target Operation Consumer	Industry
Properties	<i>Request/Response</i> message exchange pattern.
Input Message Definition	Please refer to Operation Message Model Section 7.1.1 Service Request Input for details.
Output Message Definition	Please refer to Operation Message Model Section 7.1.2 Service Request Output for details.
Fault Definition	Please refer to Operation Message Model Section 7.1.3 Service Request Fault Messages for details. As discussed in Section 4: Service Use Case the following faults may be reported: <ol style="list-style-type: none"> 1) Unauthenticated access 2) Unauthorized request 3) Malformed message 4) Service Unavailable

Non Functional Requirements

Non Functional Requirements/Technical Details	
Frequency	Less than ten per vehicle/instance of the WS per week.
Peak Throughput Time	No significant peaks are expected.
Peak Throughput Volume	No significant peaks are expected.
Payload Size	~ 5KB per Service Request

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Non Functional Requirements/Technical Details	
Attachments	None
Attachment Size	N / A
ACK Time Interval	2 minutes
Retry Time Interval	2 minutes
Number of Retries	5
Biz. Response Time Interval	N/A – no business response to this message.
Time to Live Span	Nominal value is 1 hour – to be confirmed between Canada and Industry on a per-fleet basis. If message cannot be delivered within 1 hour, revert to secondary delivery channel, which may be manual.
Service Op Availability	During core processing hours. The specific period will be defined during later phases of service realization 95% available uptime is the goal of the service
Downtime Requirements	The service cannot be used during established maintenance windows, which is currently expected to be for about 2 hours per week. The unavailability window may be accumulated and invoked during major maintenance periods, but ensuring that the overall availability of the service is still maintained.
Dead Message Handling	Alternative communication channel applies to report that this operation is not available when Industry cannot successfully send Service Request business objects to Canada EDE. See Service Interaction Model [Ref. 3].

8.2 Detailed Operation Characteristics – SendServiceRequestError

Canada system will invoke the exposed Industry ServiceRequest Error service through this operation. A Service Request error message will contain Canada-reported business errors encountered while attempting to process a Service Request message generated by Industry.

Refer to ServiceRequest_Industry.wsdl for implementation details.

Detailed Operation Characteristics

Interface Definition	Description
Operation Name	Send Service Request Error
Operation Technical Name	SendServiceRequestError

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Interface Definition	Description
Operation Description	This operation is invoked by Canada to send a Business Error message to Industry. The Business Error describes errors encountered while processing Industry's Service Request message.
Target Operation Provider	Industry
Target Operation Consumer	Canada EDE
Properties	<i>Request-Response</i> message exchange pattern.
Input Message Definition	Please refer to Operation Message Model Section 7.2.1 Service Request Error Input for details.
Output Message Definition	Please refer to Operation Message Model Section 7.2.2 Service Request Error Output for details.
Fault Definition	Please refer to Operation Message Model Section 7.2.3 Service Request Error Fault for details.

Non Functional Requirements

Non Functional Requirements/Technical Details	
Frequency	Less than <i>SendServiceRequest</i> .
Peak Throughput Time	Same as <i>SendServiceRequest</i> .
Peak Throughput Volume	Same as <i>SendServiceRequest</i> .
Payload Size	~ 5KB per Error
Attachments	None
Attachment Size	N/A
ACK Time Interval	2 minutes
Retry Time Interval	2 minutes
Number of Retries	5
Biz. Response Time Interval	N/A
Time to Live Span	Nominal value is 1 hour – to be confirmed between Canada and Industry on a per-fleet basis. If message cannot be delivered within 1 hour, revert to secondary delivery channel, which may be manual.
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

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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 Industry cannot successfully send Service Request error message(s) to Canada EDE. See Service Interaction Model [Ref. 3].

8.3 Service Bindings

8.3.1 SOAP Over http

The initial 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) 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 elements⁴.

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.

⁴ See the Service Request WSDL file for the precise binding

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9 Definitions, Acronyms, Abbreviations

Term	Description
BUC	Business Use Case
CAGE	Commercial And Government Entity
CMMS	Canada Maintenance Management System
CSS	Canada Supply System
DND	Department of National Defence
EDE	Electronic Data Exchange
EIE	Electronic Information Environment
ERD	Entity-Relationship Diagram
DRMIS	Defense Resource Management Information System
HTTP	Hyper Text Transfer Protocol
Industry	The industry contracted to provide support to Canada DND according to ISSCF
ISS	In Service Support
JMS	Java Message Service
MPN	Manufacturer Part Number
PBC	Performance based contracting
SOAP	Simple Object Access Protocol
TBD	To Be Defined, To Be Determined
UML	Unified Modeling Language
XML	Extensible Markup Language
WS	Weapon System

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10 Appendix A - Entity Relationship Model

Information Model – Entity-Relationship View

SERVICE REQUEST		
P *	Customer_ID	VARCHAR (26)
P *	Service_Request_Number	VARCHAR (10)
*	Cage	VARCHAR (5)
*	MPN	VARCHAR (34)
	Serial_Number	VARCHAR (30)
*	Quantity	Integer
*	Comments	VARCHAR (40)
*	UOI	VARCHAR (3)
	Requested_Start_Date	Datetime
	Requested_End_Date	Datetime
	Long_Description	VARCHAR (2000)
	Orig_MTL_No	VARCHAR (40)
	Priority	VARCHAR (1)
	Priority_Description	VARCHAR (20)
	External_Task_List_ID	VARCHAR (40)
	Main_Work_Centre	VARCHAR (8)
	Main_Work_Centre_Description	VARCHAR (40)
SERVICE REQUEST_PK (Service_Request_Number, Customer_ID)		

Figure 10-1 Service Request ERD

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11 Document History

Revision Number	Description	Date
1.0	Ready for navy RFP	13 October 2015

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