



Electronic Information Environment (EIE)

Service Specification Document/Interface Control Document Master Data Navy Measurement Point Service– External

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

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1 Introduction

This document establishes an interface between Canada Electronic Data Exchange (EDE) system and the ISS Contractor responsible for maintenance of a ship class subject to Performance Based Contracting (PBC). This interface will be used by the ISS Contractor to send Measurement Point (MPNT) messages to Canada EDE. To support the MPNT transfer between Canada EDE and the ISS Contractor, both systems need to support specific Web Service operations as well as request and response Extensible Markup Language (XML) schemas as described in this document. The Measurement Point service includes an operation for Canada EDE to report acknowledgement messages back to Industry¹.

1.1 Intended Audience

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

1.2 References

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

- [Ref. 1M] PBC Business Process Catalogue Annex M: Navy Supply Process Model - In the Context of Performance Based Contracting (PBC);
- [Ref. 1P] Business Process Catalogue Annex P: Navy Canada Maintenance Management System Data Initialization In Support of Performance Based Contracting (PBC);
- [Ref. 1L] Annex L: Navy Maintenance Process Model – In the Context of Performance-Based Contracting (PBC);
- [Ref. 2] Electronic Information Exchange Service Interaction Model;
- [Ref. 3] DRMIS Master Data Business Guidelines Air Force ISSCF fleets;
- [Ref. 4] Navy Part Issue Service Specification;
- [Ref. 5] Navy Materiel Master Record Service Specification;
- [Ref. 6] Data Package Service Specification;
- [Ref. 7] EIE Business Use Case BUC 2.2 Exchange Master Data – Inbound.

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

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2 Business Information

Business Information is based on the EIE Business Process model for Data Initialization [Ref. 1M] and the Defense Resource Management Information System (DRMIS) Master Data Business Guidelines Air Force ISSCF fleets [Ref. 3].

A Materiel Master Record (MMR) identifies all items required to support the weapon system maintenance and supply processes in DND. MMRs include all materiel (spares, consumables, serialized or not, tools, test equipment, etc.) subject to materiel management processes. An MMR is required before the item or part can be referenced or transacted upon in Canada's systems. For PBC managed weapon systems, materiel is always identified by the combination of the manufacturer Commercial And Government Entity (CAGE) code and the Manufacturer Part Number (MPN). The serialized parts² which make up a Weapon System (WS) are tracked with an Equipment Master Record (EMR). Every EMR references an MMR to define the EMR type and its location relative to the WS "As-Designed" structure.

Another view of the WS used in maintenance is the *Functional Location* (FLOC) hierarchy. A functional location refers to a physical part of a WS which is intrinsic to the body of the WS and cannot be removed or replaced by normal maintenance procedures.

An EMR or FLOC may have associated Measurement Points to define data about the EMR/FLOC for maintenance purposes. The measurement point defines the *measurement code* to determine what is measured. A measurement point's actual measurement values are saved in a structure called a "Measurement Document". The measurement values may be entered manually, may be inserted by a Health and Usage Monitoring System "HUMS³" type system, or may be propagated automatically from other measurement points.

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

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

- Canada Maintenance Management System (CMMS)
- Canada Supply System (CSS)

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

² In other words, parts with serial numbers.

³ "HUMS" refers in general to a system to upload data from on-board (the WS) computers to CMMS.



2.1 Business Processes

2.1.1 MPNTs in Supply Materiel Processes

During Supply Materiel business processes Canada DND will demand parts and the ISS Contractor will supply parts to be installed on a WS. When a serialized part and its EMR is provided by Industry its MPNTs must be sent from the ISS Contractor to Canada so that Canada may properly track the part during its life-time with DND.

See [Ref. 1M] for further details.

2.1.2 MPNTs in Maintenance History Processes

As part of the Maintenance History business processes the ISS Contractor can perform maintenance which can result in removal and installation of serialized parts on a WS. Industry must send to Canada the MPNT data associated with these removal and install activities to allow Canada to properly track the part during its life-time with DND.

See [Ref. 1L] for further details.

2.1.3 MPNTs in Master Data Processes

the ISS Contractor may perform Engineering Change activities on a ship resulting in changes to the Master Data configuration of the WS, including EMR structure. In these instances, the ISS Contractor will provide Master Data, including MPNT data, for the updated configuration of the WS in accordance with the approved Engineering Change. Master Data must be approved by designated DND staff with the requisite qualifications prior to being used in Production.

See [Ref. 1P] for further details.

2.2 Business Triggers

2.2.1 Supply Materiel Business Triggers

Please see Business Triggers in the Part Issue Service Specification [Ref. 4].

2.2.2 Maintenance History Business Triggers

As per the Maintenance History Business Process [Ref. 1L], the following business events may result in MPNT data being sent from Industry to Canada EDE:

- Uninstall (removal) of a serialized part from the ship;
- Installation of a serialized part on the ship;

2.2.3 Master Data Business Triggers

As per the Data Initialization Business Process [Ref. 1P], the following business events may result in MPNT data being sent from the ISS Contractor to Canada EDE:

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- Prior to delivery of subsequent WS in the ship class⁴;
- The result of an engineering change.

For Master Data a direct⁵ communication will take place between the ISS Contractor and Canada DND to advise Canada DND of the availability of new Master Data. Canada's designated official will, through CMMS, initiate the transfer of the Master Data from the ISS Contractor.

⁴ For WS where Master Data provided by Industry partner.

⁵ Phone, fax, email, but not through Canada EDE services.

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2.3 Master Data Unit of Work

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

To achieve consistency, Master Data business objects are always sent from the ISS Contractor to Canada EDE in a single **unit of work**. The unit of work is a logical “package” of Master Data business objects (possibly of more than one type) with a unique identifier. Every individual Master Data message has a reference to its containing unit of work. A unit of work will have a **manifest** which explicitly defines the exchange types and number of **business objects**⁶ per exchange type, in the unit of work.

In a similar manner, Measurement Point records sent as a result of a supply transaction are sent in a single **unit of work** associated with the Part issue transaction. Please refer to Part Issue Service Specification [Ref. 4] for details.

Likewise for maintenance history, Measurement Point records sent as a result of a removal or installation action are sent in a single **unit of work** associated with the ‘EMR history’ transactions – Measurement point, Measurement Document and Maintenance Plan.

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

⁶ When multiple business objects are combined in a single message, the manifest count always applies to the number of business objects irrespective of the number of messages.

3 Business Constraints

Terminology

The input to the service is an **MPNT message** which consists of one or more **MPNT business objects** and metadata (e.g., message header) required for correct message processing between Canada and Industry.⁷

Constraints on Usage of the Service

- 1) Canada EDE shall ensure every Master Data message is only processed from an Industry which is properly authenticated and authorized to provide Master Data for that ship class.
- 2) Industry must define a unit of work with a unique identifier prior to sending Master Data; each Master Data message must reference its containing unit of work.
- 3) The unit of work for Master Data always contains an explicit manifest.
- 4) Master Data messages will be signed using digital certificates between Canada EDE and Industry. Please see Service Interaction Model [Ref. 2] for details.

Constraints on Behaviour of the Service

- 5) Canada EDE **does** expect that within a single message there can be more than one Master Data business object - all business objects must be of the same exchange type as defined by the interface and declared in the message header.
- 6) Canada EDE will report Master Data technical processing errors through the corresponding Error operation of the invoked Master Data service.
- 7) Canada EDE may attempt to re-send Master Data error messages (i.e., repeat operation invocations) in response to technical errors. This behaviour is controlled by parameters for each operation. Please see Service Interaction Model [Ref. 2] for details.

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

4 Service Use Case

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

4.1 Service Context

4.1.1 Supply Materiel Service Context

When used in the context of a Supply Materiel business process the service context is the same as the Part Issue service. Please see Service Context in the Navy Part Issue Service Specification [Ref. 4].

4.1.2 Maintenance History Service Context

When used in the context of a Maintenance History business process, the service context is Industry-performed Maintenance.

4.1.3 Master Data Service Context

When used in the context of a Master Data business process the service context is the same as the Materiel Master Record Service. Please see the Navy Materiel Master Record Service Specification [Ref. 5].

4.2 Successful Request and Technical Response

This scenario applies for usage of the service in both Supply Materiel and Master Data business processes.

This is the main or “Happy Day” scenario. This scenario describes the interaction between Canada EDE and Industry for the MPNT Service. Some validation steps and technical responses are not shown in the following sequence diagram (Figure 4-1) – full details are in the Service Interaction Model [Ref. 2].

The “technical response” 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.

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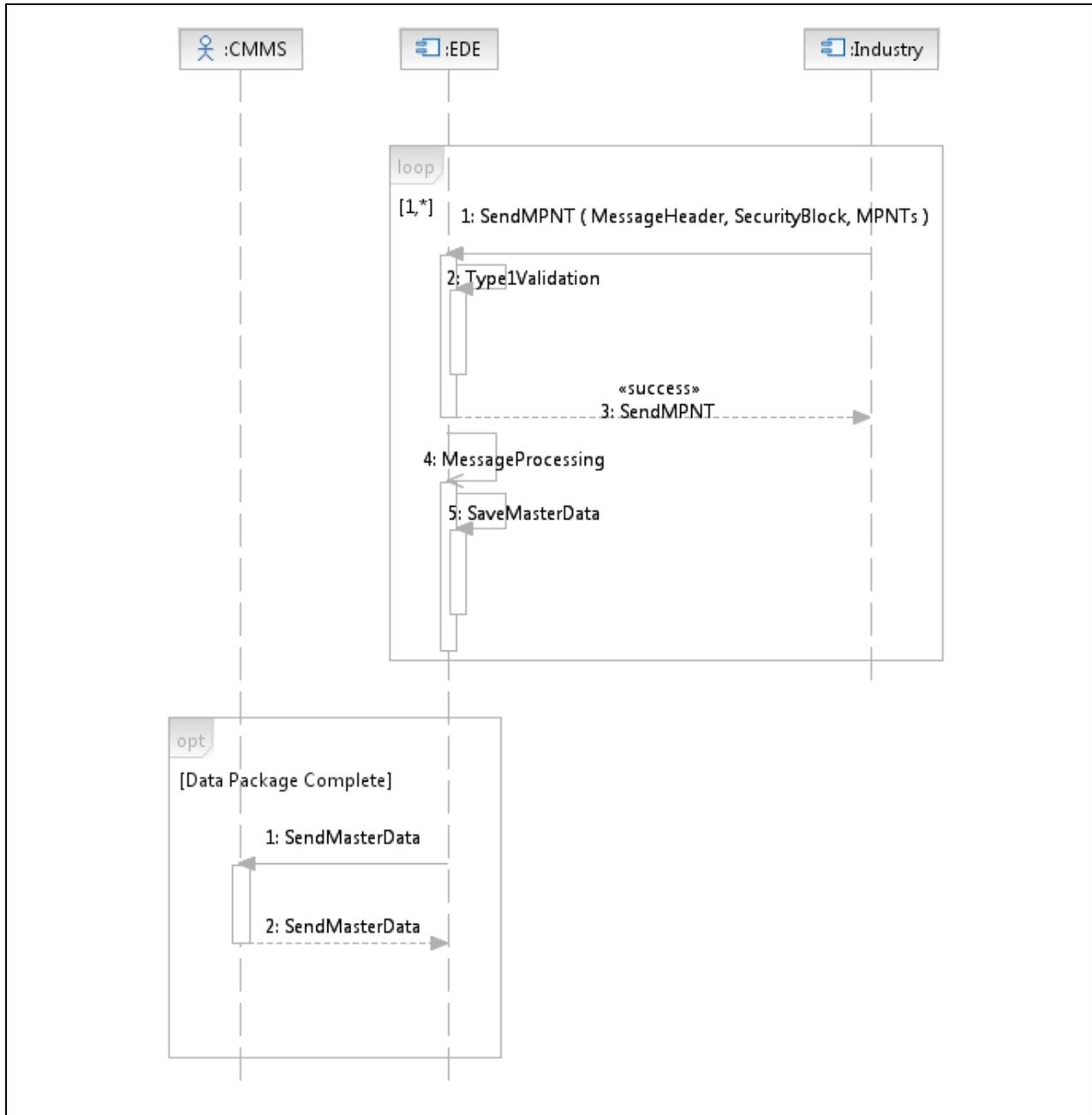


Figure 4-1 MPNT Message Flow

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Main Flow	
Scenario	“Happy Day:” Industry successfully sends MPNT business objects to Canada.
Pre-Condition	A business trigger – specific to the business process – has occurred. Industry has prepared a data package containing one or more MPNT business objects. If a unit of work is required, Industry has initiated creation of the unit of work and Canada EDE has confirmed creation.
Post-Condition	MPNT business objects successfully received by Canada EDE.
Steps	<p>Industry begins a loop to send MPNT messages to Canada EDE⁸.</p> <ol style="list-style-type: none"> 1) Industry invokes ‘SendMPNT()’ operation passing UOW ID and one or more MPNT business objects. (See Input Body definition.) Industry waits for technical response. 2) Canada EDE initiates “Type 1” validation. In this scenario there is no error. Canada EDE accepts “custody” of the MPNT business objects in the message. 3) Canada EDE returns to Industry a “success” technical response for the SendMPNT() operation. (See Output Body definition.) 4) Canada EDE begins internal processing of the message. In this scenario there is no error. 5) Canada EDE saves MPNT business objects to send to CMMS once unit of work is complete. <p>Industry continues loop to send more MPNT business objects (if any) to Canada EDE.</p> <p>Once Canada EDE has received a complete Master Data package from Industry, Canada EDE will send to CMMS. The details of this process are out of scope of this specification.</p>

Please see Data Package Service Specification [Ref. 6] for the scenario of confirmation from CMMS Master Data has been deployed to operations.

4.3 Alternate Scenarios

The MPNT Message Flow with Type 1 error sequence diagram is shown in Figure 4-2. The following scenarios apply to all uses of the MPNT service.

⁸ In practice, MPNT messages may be interleaved with other Master Data messages from the same unit of work, or other units of work.

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

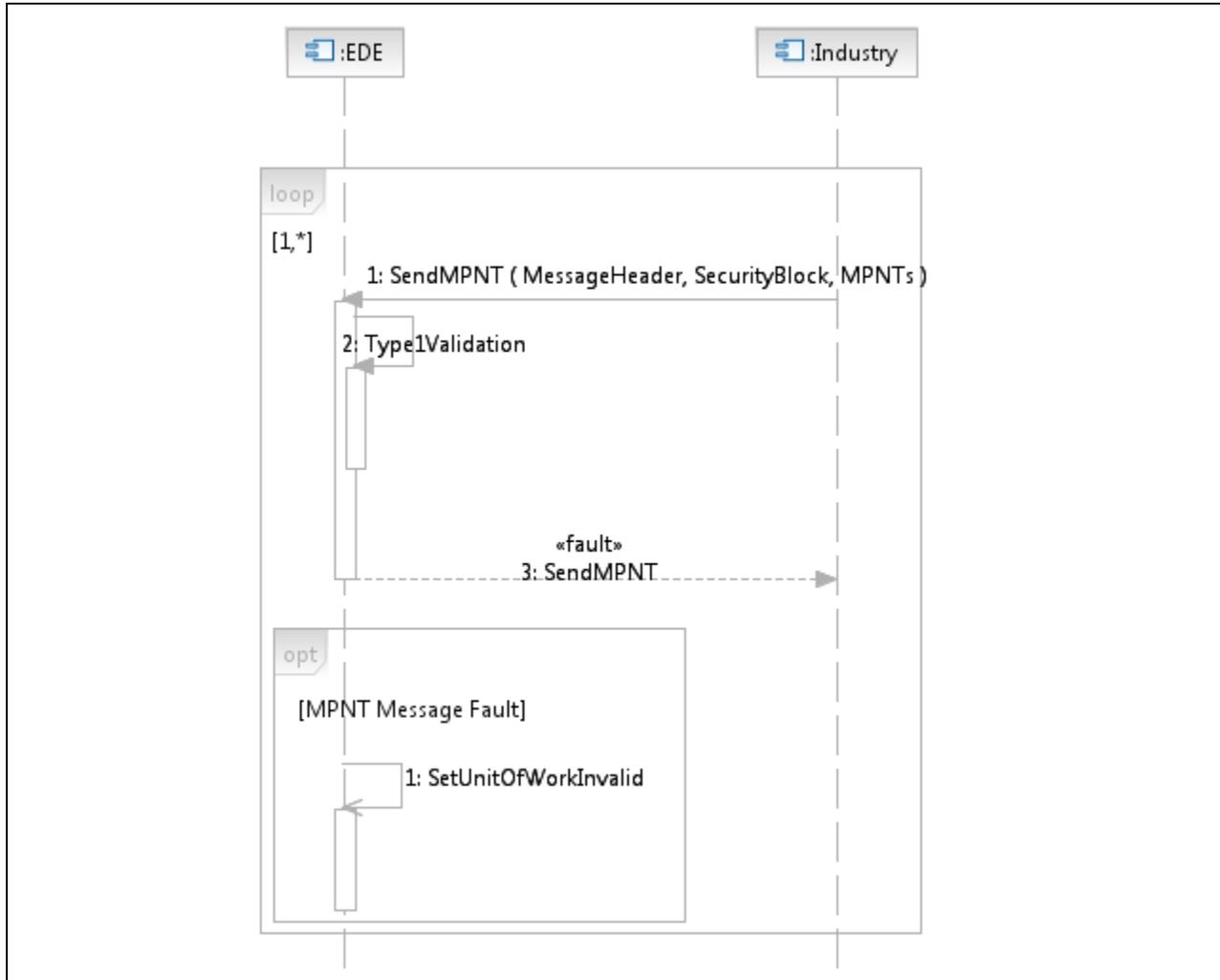


Figure 4-2 MPNT Message Flow with Type 1 error

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Alternate Flow 1	
Scenario	Type 1 Errors detected by Canada EDE prior to accepting custody of the message. Detailed specification of Type 1 errors are in Service Interaction Model [Ref. 2].
Pre-Condition	Same as Main Flow.
Post-Condition	Canada EDE sends technical response containing a fault message (see Service Interaction Model [Ref. 2]) to Industry. Industry ceases sending Master Data (of any exchange type) for this unit of work.
Steps	<ol style="list-style-type: none"> 1) Industry invokes 'SendMPNT()' operation containing one or more MPNTs. 2) Canada EDE checks for Type 1 errors – an error is found; 3) Canada EDE constructs the fault message and sends the fault message to Industry in the technical response to the original SendMPNT() operation invocation. (See Fault Body definition.) <p>In the same iteration through the loop where a MPNT Message fault was found:</p> <ol style="list-style-type: none"> 1) Canada EDE updates unit of work status to Invalid and deletes the Master Data received so far in the invalid unit of work.

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

The MPNT Message Flow with Type 2 Error sequence diagram is shown in Figure 4-3.

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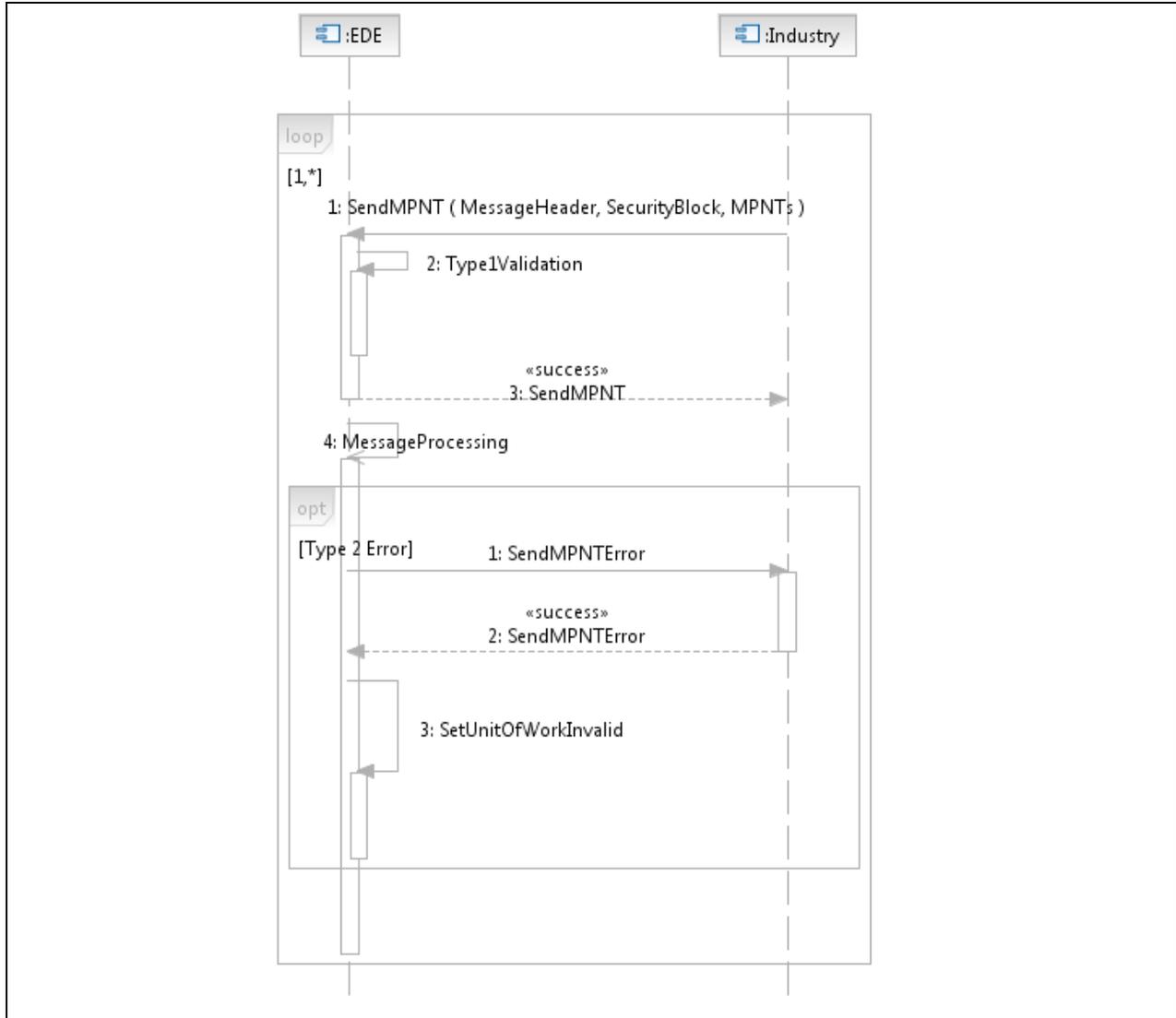


Figure 4-3 MPNT Message Flow with Type 2 Error

Alternate Flow 2 (Canada EDE Service unresponsive)	
Scenario	Industry does not receive technical response within ACK_TIME_INTERVAL.
Pre-Condition	Industry has invoked the operation but does not receive the technical response within the time specified for the MPNT service.
Post-Condition	Industry marks the message as Dead Message.

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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 protocol (See Service Interaction Model [Ref. 2]).
Alternate Flow 3 (Business Validation Failure) -applicable to Supply Materiel and Maintenance History Context	
Scenario	CMMS business validations fail on one or more Master Data business objects.
Pre-Condition	A complete unit of work (including MPNT business objects) has been received by Canada EDE. Canada EDE begins sending to CMMS.
Post-Condition	Canada EDE sends error information to Industry. Canada EDE deletes the data package in the unit of work.
Steps	<ol style="list-style-type: none"> 1) Canada EDE invokes CMMS MPNT operation and receives a positive technical response. 2) MPNT business object(s) fail CMMS's system-enforced business rules. 3) Canada EDE sends business error information to Industry using the SendMPNTErrror() operation of the MPNT service. (See Error Input Body definition.)
Alternate Flow 4 (CMMS Business Error) - Applicable to Master Data context	
Scenario	CMMS reports a business error when attempting to load one or more Master Data business objects.
Pre-Condition	All business objects have been received by CMMS, and CMMS starts its data load process. Canada CMMS sends TPMS message to Canada EDE.
Post-Condition	Canada EDE sends technical problem through TPMS interface to Industry.
Steps	<ol style="list-style-type: none"> 1) Canada EDE invokes Industry TPMS operation and receives a positive technical response.

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5 Service Description – Measurement Point Service

5.1 Service Overview

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

As part of the Measurement Point service Industry will implement and expose two operations:

- An error reporting operation used by Canada EDE to report technical errors (Section 4, Alternate Flow 2) and business errors (Section 4, Alternate Flow 4);
- An acknowledgement service optionally⁹ used by Canada EDE to report successful delivery of MPNT business objects to CMMS.

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

5.2 Service Properties

Service Property	Description
Enterprise Service Name (Business)	Measurement Point Service
Enterprise Service Name (Technical)	MeasurementPointService (Abbreviated in this document to MPNT service.)
Purpose	This service supports the Canada EDE Master Data and Supply business processes. On the occurrence of business triggers, Industry uses this service to send MPNT messages to Canada EDE.
Business Response Time Interval	Will be determined between Canada and Industry on a per-ship class basis.
Service Domains	Master Data, Maintenance History and Supply Materiel
Business Owner	ADM (IM)
Service Grouping	Master Data
Source Provider	SendMPNT() - Canada EDE SendMPNTAck() – Industry SendMPNTErrror() - Industry

⁹ Use of this positive acknowledgement is determined between Canada and Industry on a per-ship class basis.

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Service Property	Description
Target Service Consumers	SendMPNT() - Industry SendMPNTAck() – Canada EDE SendMPNTErrror() – Canada EDE
Business Process Supported (now)	Master Data processes: <ul style="list-style-type: none"> Initial Data Load; Engineering Change; Supply processes: <ul style="list-style-type: none"> Part Issue (including PUK issue); Maintenance History processes: <ul style="list-style-type: none"> Industry-performed maintenance;
Business Process Supported (future)	None currently identified
Business Objective Supported	See Section 2: Business Information .
Expected life time	The full lifecycle of the subject weapons system.

5.3 ‘SendMPNT()’ Operation

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

5.4 ‘SendMPNTAck()’ Operation

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

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

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5.5 'SendMPNTErrror()' Operation

This operation is used by Canada EDE to send an error message to Industry after internal message processing detects a Type 2 error condition (see [Ref. 2]). Industry's implementation of this operation will perform Type 1 validation on the fault message. Industry will return a technical response to Canada EDE.

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



6 Information Model

This section describes the **business objects** which are used in the MPNT service. The Unified Modeling Language (UML) notation is used. A functional view¹⁰ of the information model is provided in the Master Data Business Guidelines [Ref. 3].

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

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

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

6.1 MPNT

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

Figure 6-1 shows the Information Model used in the Measurement Point service. This section primarily discusses the structure of the information model, details of attributes may be found in the EIE Business Process model for Data Initialization [Ref. 1P]. In the following underlined italic text refers to specific classes in Figure 6-1.

The class MeasurementPoint represents the measurement point. The class EMR_FLOC_REF encapsulates **either** a CAGE/MPN/Serial Number combination to uniquely identify an EMR **or** a Function Location Identifier (FLOC ID) to uniquely identify a FLOC. The MeasurementPoint contains two copies of EMR_FLOC_REF. One, the link named 'TechnicalObject' is mandatory and defines the element of the WS technical structure to which the measurement point applies. The optional link 'Parent' is used in the case where a measurement point's values are to be set by copying from another measurement point.

The class MeasurementPoint *has* one or two Description fields and different languages may be used¹¹ as indicated by the <<lang>> stereotype.

The measurement is defined by the two fields MeasurementName (the physical property to measure) and MeasurementPosition (to distinguish multiple measurements of the same physical property). Both MeasurementName and MeasurementPosition have description fields for further detail.

The class MeasurementPoint references a code table, MeasurementPointCat is a code used in reporting.

¹⁰ The Functional View details the collection of fields which make up MPNT business objects.

¹¹ The language(s) to be used are determined between DND and Industry. Language tags are based on www.w3.org standards.

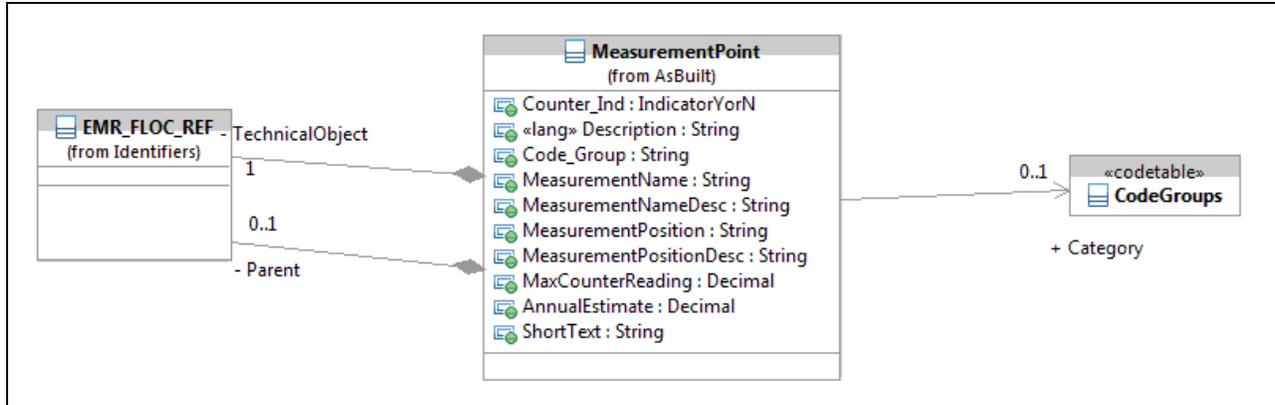


Figure 6-1 Information Model – Measurement Point

6.2 As Built Structure

The measurement point is part of the WS “As Built” structure. An overview of “As Built” structure is shown in Figure 6-2 below; each business object is described in one of the Service Specification documents.

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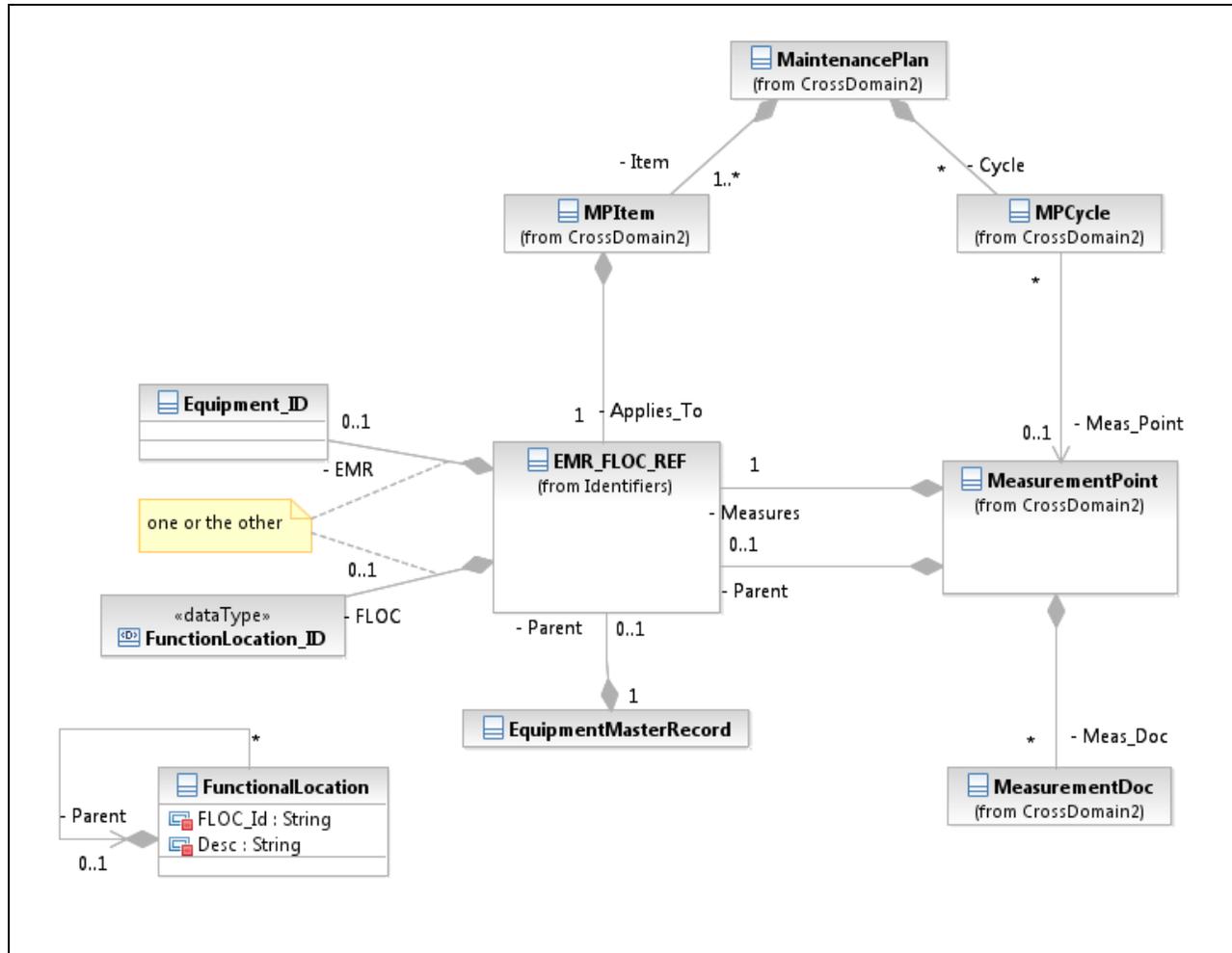


Figure 6-2 Information Model – As Built Structure

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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 PBC information exchange.

All Master Data services follow the request/response model and each operation definition includes a distinct input, output and fault message. See Service Interaction Model [Ref. 2] for definition of the common MessageHeader and SecurityClassification elements. BusinessContext allows Industry to include contextual information with an input message. The 'Purpose' field is a value agreed between Canada EDE and Industry and may affect handling of the message. The remaining fields are populated by Industry and may be replayed in error messages¹².

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

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

7.1 MPNT Input Body

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

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

¹² Business Context is further discussed in the Unit of Work service specification.

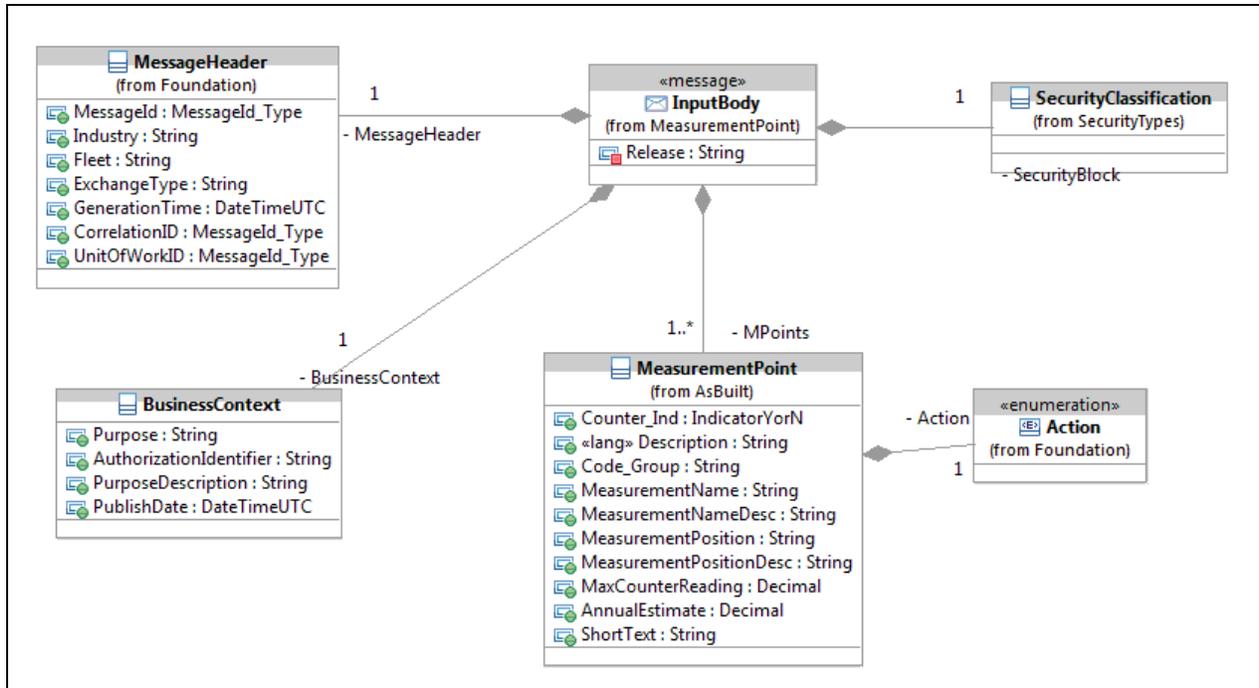


Figure 7-1 MPNT Input Body

The MessageHeader UnitOfWorkID must equal the UnitOfWorkID value of an existing valid unit of work.¹³ The MessageHeader CorrelationID must equal the MessageId of the message which created the unit of work. Purpose and ContextDescription fields must match the corresponding fields in the Unit of Work which envelopes this input message.

The MPNT InputBody also contains an attribute ‘Release’ which designates the release of the MPNT service. The ‘Release’ attribute uses an “X.Y” numbering convention and the value is hard-coded in the XML schema for every service. The value will be incremented when a new version of the service is released¹⁴.

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

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

7.2 MPNT Output Body

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

- A Message Header;

¹³ Type 1 validation will check if the unit of work is in a non-error state.

¹⁴ The rules for incrementing the ‘Release’ attribute for a service will be in a separate document.

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- A Custody object.

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

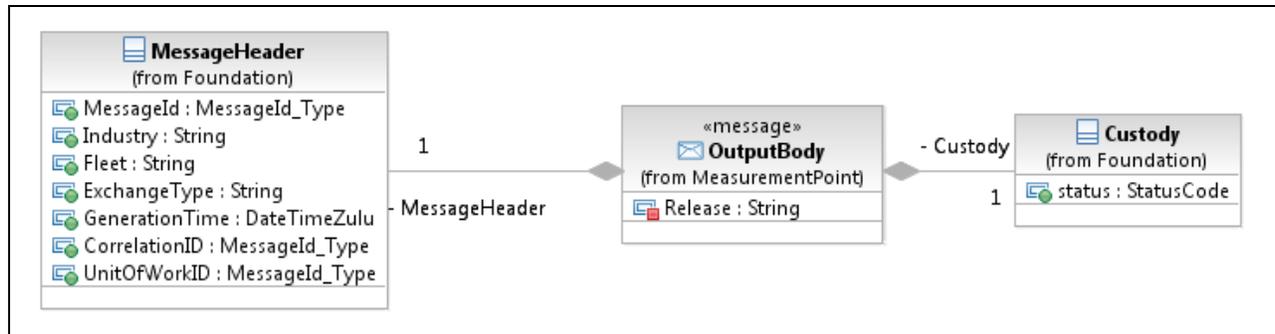


Figure 7-2 MPNT Output Body

For an MPNT OutputBody:

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

7.3 MPNT Fault Body

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

- A Message Header;
- A Security Block;
- One or more FaultBlocks.

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

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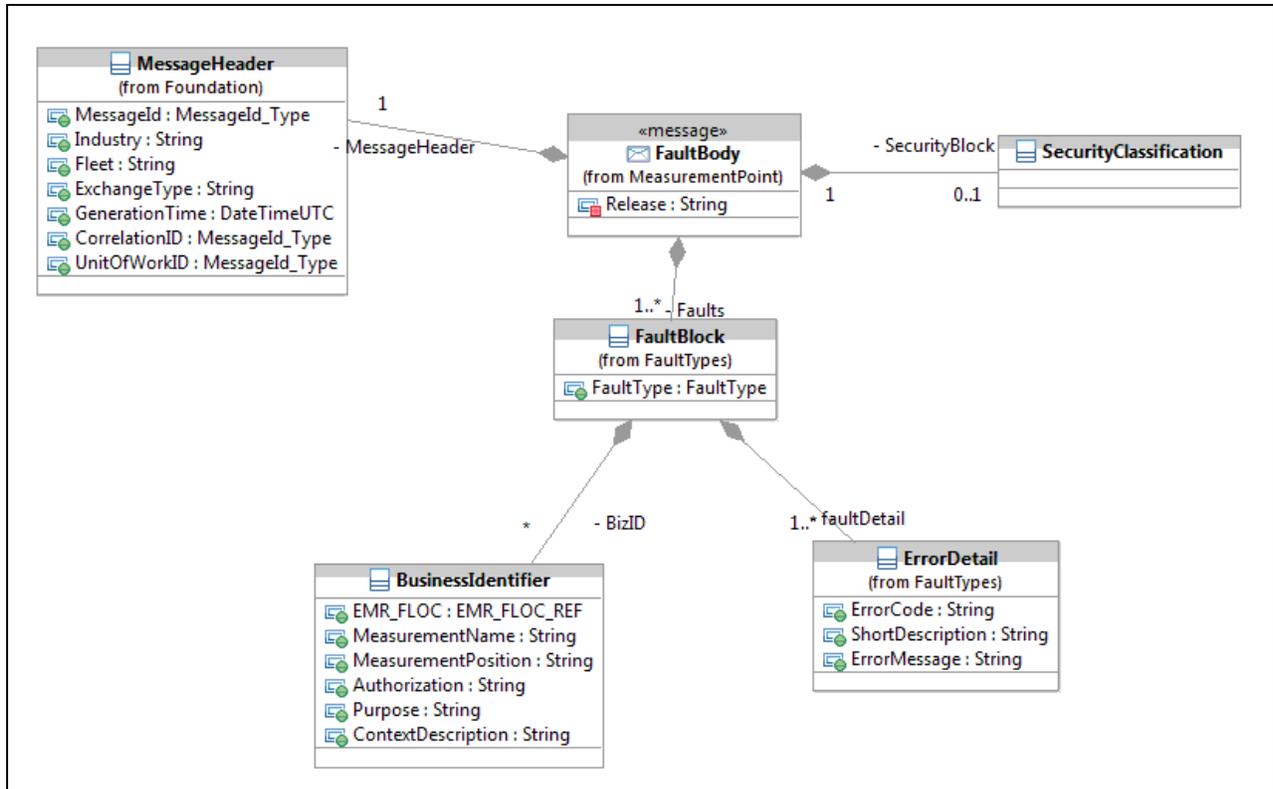


Figure 7-3 MPNT Fault Body

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

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

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

7.4 MPNT Acknowledgement Input Body

The input to the SendMPNTAck() operation consists of a Message Header, a list of business identifiers, and a “success” status indicating the business objects were accepted in CMMS (see Figure 7-4).

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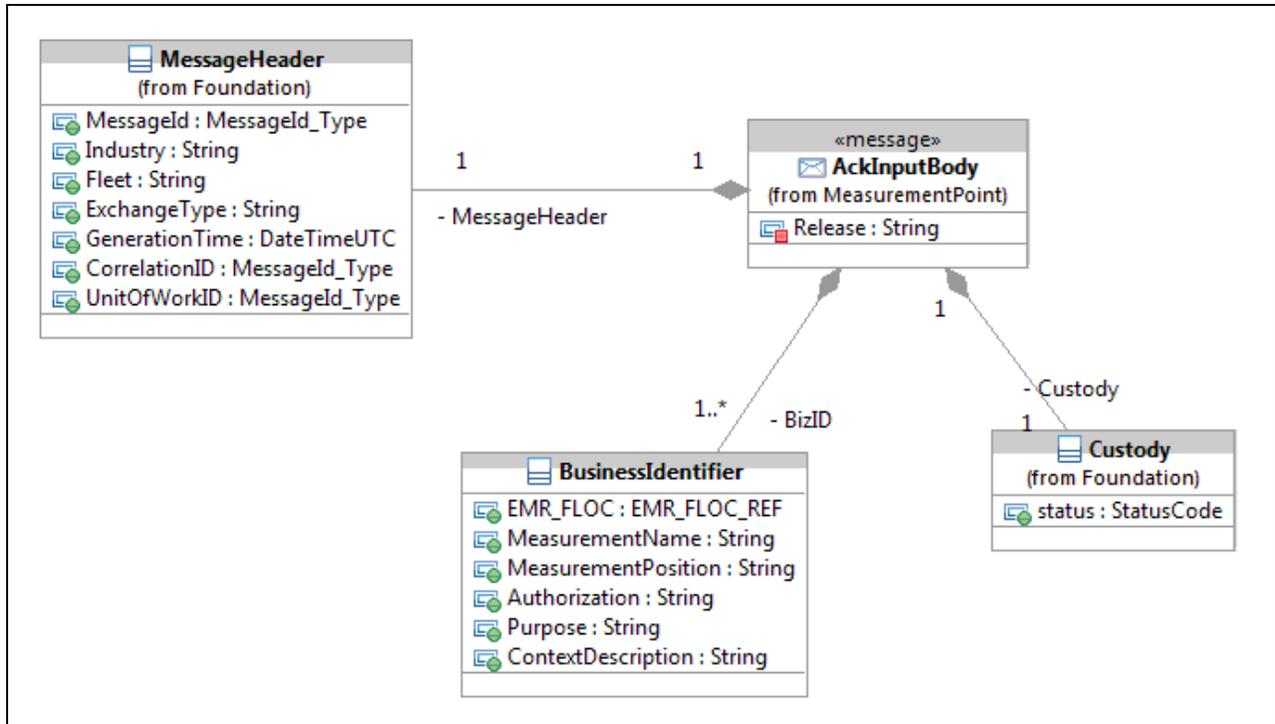


Figure 7-4 MPNT Acknowledgement Input Body

The MessageHeader has a new unique MessageId and the CorrelationID is set to the MessageId of the MPNT InputBody which is being acknowledged.

7.5 MPNT Error Input Body

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

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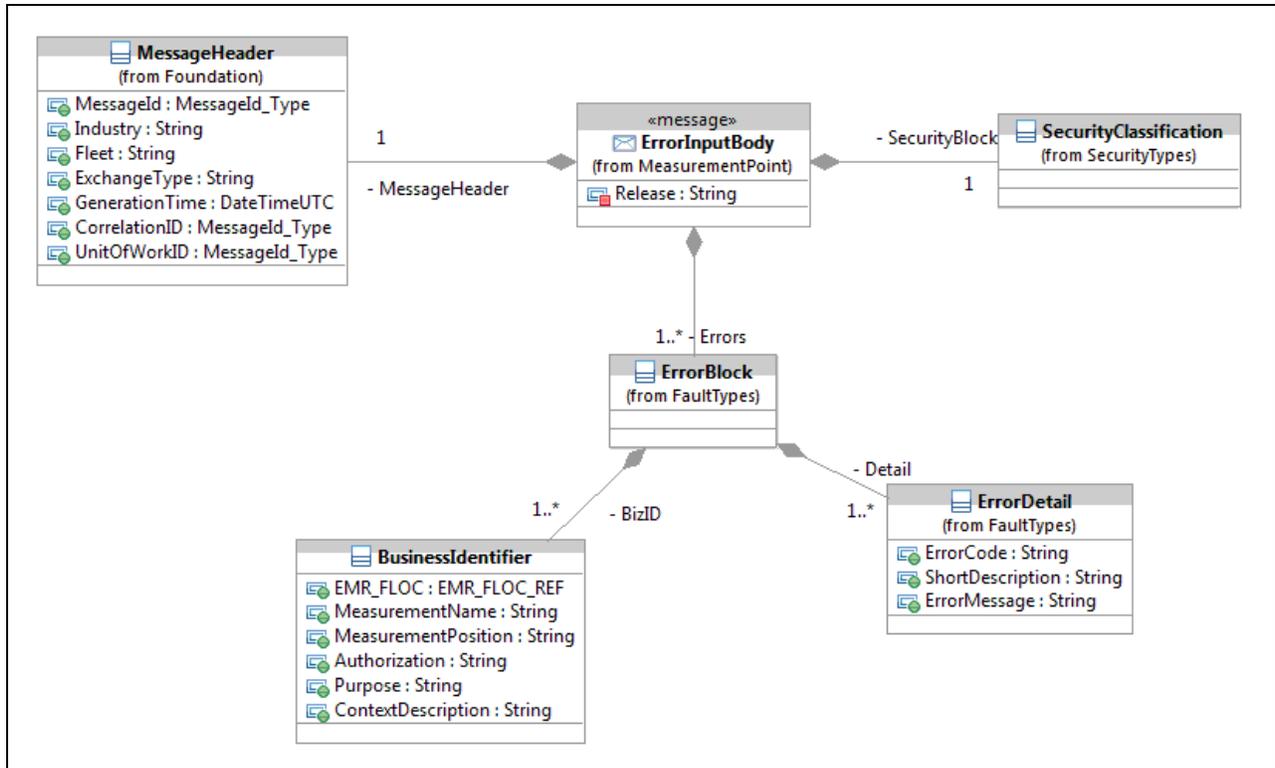


Figure 7-5 MPNT Error Input Body

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

The MessageHeader has a new unique MessageId.

If the error is a Type 2 error detected by Canada EDE then the Correlation ID and UnitOfWorkID are set based on the MessageHeader of the MPNT Input Body for which the errors are being reported.

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

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

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

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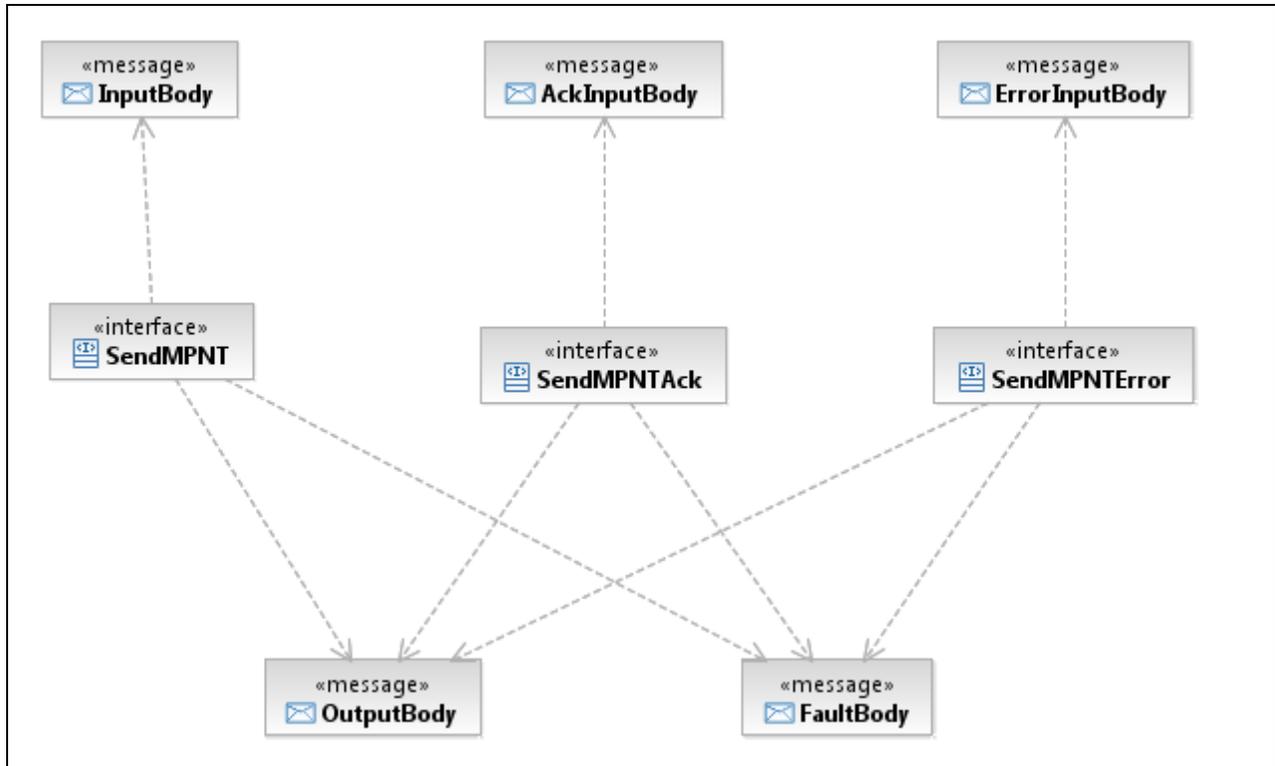


Figure 7-6 MPNT Operations to Input/Output/Fault Mapping

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8 Service Operation Details

8.1 Detailed Operation Characteristics – SendMPNT()

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

Detailed Operation Characteristics

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

Non-Functional Requirements

Non-Functional Requirements/Technical Details	
Frequency	A-periodic according to business triggers (Section 2.2). Will be determined between Canada and Industry on a per-ship class basis.
Peak Throughput Time	Based on Service Level Agreements (SLA) to be determined between Canada and Industry on a per-ship class basis.
Peak Throughput Volume	Based on Service Level Agreements (SLA) to be determined between Canada and Industry on a per-ship class basis.
Payload Size	<1Kb per business object.

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

8.2 Detailed Operation Characteristics – SendMPNTErr()

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

Refer to Measurement Point WSDL files for implementation details.

Detailed Operation Characteristics

Interface Definition	Description
Operation Name	Send MPNT Error
Operation Technical Name	SendMPNTErr()

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Interface Definition	Description
Operation Description	This operation is invoked by Canada EDE to send one or more MPNT errors to Industry.
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 7.5 MPNT Error Input Body for details. Please refer to Service Interaction Model [Ref. 2] for Type 2 faults for the error inputs which may be sent in this operation.
Output Message Definition	Please refer to Operation Message Model Section 7.2 MPNT Output Body for details.
Fault Definition	Please refer to Section 7.3 MPNT Fault Body for details. Please see Service Interaction Model [Ref. 2] for faults which may be returned by this operation.

Non-Functional Requirements

Non-Functional Requirements/Technical Details	
Frequency	Same as SendMPNT() operation. Worst case is one error per MPNT business object.
Peak Throughput Time	Same as SendMPNT() operation.
Peak Throughput Volume	Same as SendMPNT() operation.
Payload Size	5KB – estimated for one ErrorBlock with one BizID and two ErrorMessage's
Attachments	None
Attachment Size	N/A
ACK Time Interval	Nominal value is 2 minutes – to be confirmed between Canada and Industry on a per-ship class basis.
Retry Time Interval	Nominal value is 10 minutes – to be confirmed between Canada and Industry on a per-ship class basis.
Number of Retries	Nominal value is 3 retries – to be confirmed between Canada and Industry on a per-ship class basis.
Biz. Response Time Interval	N/A
Time to Live Span	60 minutes.

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

8.3 Detailed Operation Characteristics – SendMPNTAck()

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

Refer to Measurement Point WSDL files for implementation details.

Detailed Operation Characteristics

Interface Definition	Description
Operation Name	Send MPNT Acknowledgement
Operation Technical Name	SendMPNTAck()
Operation Description	This operation is invoked by Canada EDE to send one or more MPNT acknowledgement objects to Industry.
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 7.4 MPNT Ack Input Body for details.
Output Message Definition	Please refer to Operation Message Model Section 7.2 MPNT Output Body for details.
Fault Definition	Please refer to Section 7.3 MPNT Fault Body for details. Please see Service Interaction Model [Ref. 2] for faults which may be returned by this operation.

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Non-Functional Requirements

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

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8.4 Service Bindings

8.4.1 SOAP Over http

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

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

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

See the Measurement Point Service WSDL file for the precise binding.

8.4.2 SOAP Over JMS

Not currently supported.



9 Definitions, Acronyms, Abbreviations

Term	Description
CAGE	Commercial And Government Entity
CM	Configuration Management
CMMS	Canada Maintenance Management System
CSS	Canada Supply System
DND	Department of National Defence
DRMIS	Defense Resource Management Information System
Canada EDE	Electronic Data Exchange
EIE	Electronic Information Environment
EMR	Equipment Master Record
FLOC	Functional LOcation
HUMS	Health and Usage Monitoring System
ISS	In Service Support
ISSCF	In Service Support Contracting Framework
MER	Master Equipment Record
MMR	Materiel Master Record
MPN	Manufacturer Part Number
MPNT	Measurement Point
PBC	Performance Based Contracting
NATO	North Atlantic Treaty Organization
NSN	NATO Stock Number
SOAP	Simple Object Access Protocol
UTC	Coordinated Universal Time
WS	Weapon System
WSDL	Web Service Definition Language
XML	Extensible Markup Language

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10 Appendix A - Entity Relationship Model

Information Model – Entity-Relationship View

MPNT	
P *	Measurement_Name VARCHAR (30)
	Cage VARCHAR (5)
	MPN VARCHAR (34)
	Serial_No VARCHAR (30)
	FLOC_ID VARCHAR (30)
	Parent_FLOC_ID VARCHAR (14)
	Parent_Cage VARCHAR (5)
	Parent_MPN VARCHAR (34)
	Parent_Serial_No VARCHAR (30)
	Parent_Measurement_Position VARCHAR (20)
	Parent_Measurement_Name VARCHAR (30)
*	Measurement_Position VARCHAR (20)
*	Measurement_Position_Desc VARCHAR (40)
	Category VARCHAR (1)
	Counter_Indicator VARCHAR (1)
	CodeGroup VARCHAR (8)
	Max_Counter_Reading FLOAT (13,2)
	Annual_Estimate FLOAT (13,2)
	Short_Text VARCHAR (40)
*	Action Integer
MER_INSTALL_PK (Measurement_Name)	

Figure 10-1 MPNT ERD

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11 Document History

Revision Number	Description	Date
1.0	Ready for Navy RFP	26 October 2015

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