



Electronic Information Environment (EIE)

Service Specification Document/Interface Control Document Master Data Navy Industry Equipment Master Record 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 Canada to send Equipment Master Record (EMR) messages to the ISS Contractor. To support the EMR 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. The Equipment Master Record service includes an operation for the ISS Contractor to report acknowledgement messages back to Canada EDE.

1.1 Intended Audience

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

1.2 References

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

- [Ref. 1] Business Process Catalogue Annex P: Navy Canada Maintenance Management System Data Initialization In Support of Performance Based Contracting (PBC);
- [Ref. 2] Electronic Information Exchange Service Interaction Model;
- [Ref. 3] DRMIS Master Data Business Guidelines Air Force ISSCF fleets;
- [Ref. 4] Navy Materiel Master Record Service Specification;
- [Ref. 5] Data Package Service Specification;
- [Ref. 6] EIE Business Use Case BUC 2.1 Exchange Master Data – Outbound;
- [Ref. 7] Master Data Initialization for Industry/ISSC Service Operational Model.

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2 Business Information

Business Information is based on the EIE Business Process model for Data Initialization [Ref. 1] 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.

The serialized parts¹ which make up a 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 Weapon System (WS) “As-Designed” structure. Each EMR (with one exception) also references its “parent” in the WS physical structure hierarchical breakdown (essentially, the WS “bill of materials”). The exception is that for the WS considered as a whole there is an EMR which is designated as the “Master Equipment Record” (MER).

An EMR may have associated Maintenance Plans and Measurement Points.

EMRs are considered part of “As-Built” data and apply to an individual WS instances.

The goal of the EMR service is to provide to a means for Canada to send to ISS Contractor the EMRs for a ship class and for ISS Contractor to acknowledge receipt of the EMR data or report errors in the data or transmission.

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

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

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

2.1 Business Processes

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

See [Ref. 1] for further details.

2.2 Business Triggers

As per the EIE Business Process model for Data Initialization [Ref. 1], the following business events may result in FFFC data being sent to Industry².

¹ In other words, parts with serial numbers.

² Within this document, Industry and ISS Contractor are synonymous and are used interchangeably

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

For Master Data a direct³ communication will take place between Industry and Canada DND to advise Industry of the availability of new Master Data. Industry will, through Canada EDE, initiate the request for transfer of the Master Data to Industry.

2.3 Unit of Work

According to PBC, ISS Contractor assumes the responsibility for Configuration Management (CM) of every WS in a ship class. With this responsibility 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 Canada EDE to ISS Contractor 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**⁴ per exchange type, in the unit of work.

For further discussion on units of work, including retry and error scenarios, please see the EIE Service Interaction Model [Ref. 2] and Master Data Operational Model [Ref. 7].

³ Phone, fax, email, but not through Canada EDE services.

⁴ 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.

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3 Business Constraints

Terminology

The input to the service is an **EMR message** which consists of one or more **EMR business objects** and metadata (e.g., message header) required for correct message processing between Industry and Canada EDE.⁵

Constraints on Usage of the Service

- 1) The Industry EMR service shall only be invoked by the Canada EDE System.
- 2) Canada DND systems shall ensure the EMR data for a WS is sent only to the Industry system which is properly authenticated and authorized to see maintenance and materiel data for that ship class.
- 3) Canada must define a unit of work with a unique identifier prior to sending Master Data; each Master Data message must reference its containing unit of work.
- 4) The unit of work for Master Data always contains an explicit manifest.
- 5) Master Data messages will be signed using digital certificates between Canada EDE and Industry. Please see Service Interaction Model [Ref. 2] for details.

Constraints on Behaviour of the Service

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

⁵ EMR messages are defined in section 7. EMR 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 EMR service are defined by one use case with several scenarios.

4.1 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. 4].

4.2 Successful Request and Technical Response

This scenario applies for all usage of the service ; Supply Materiel, Maintenance History 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 EMR 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.

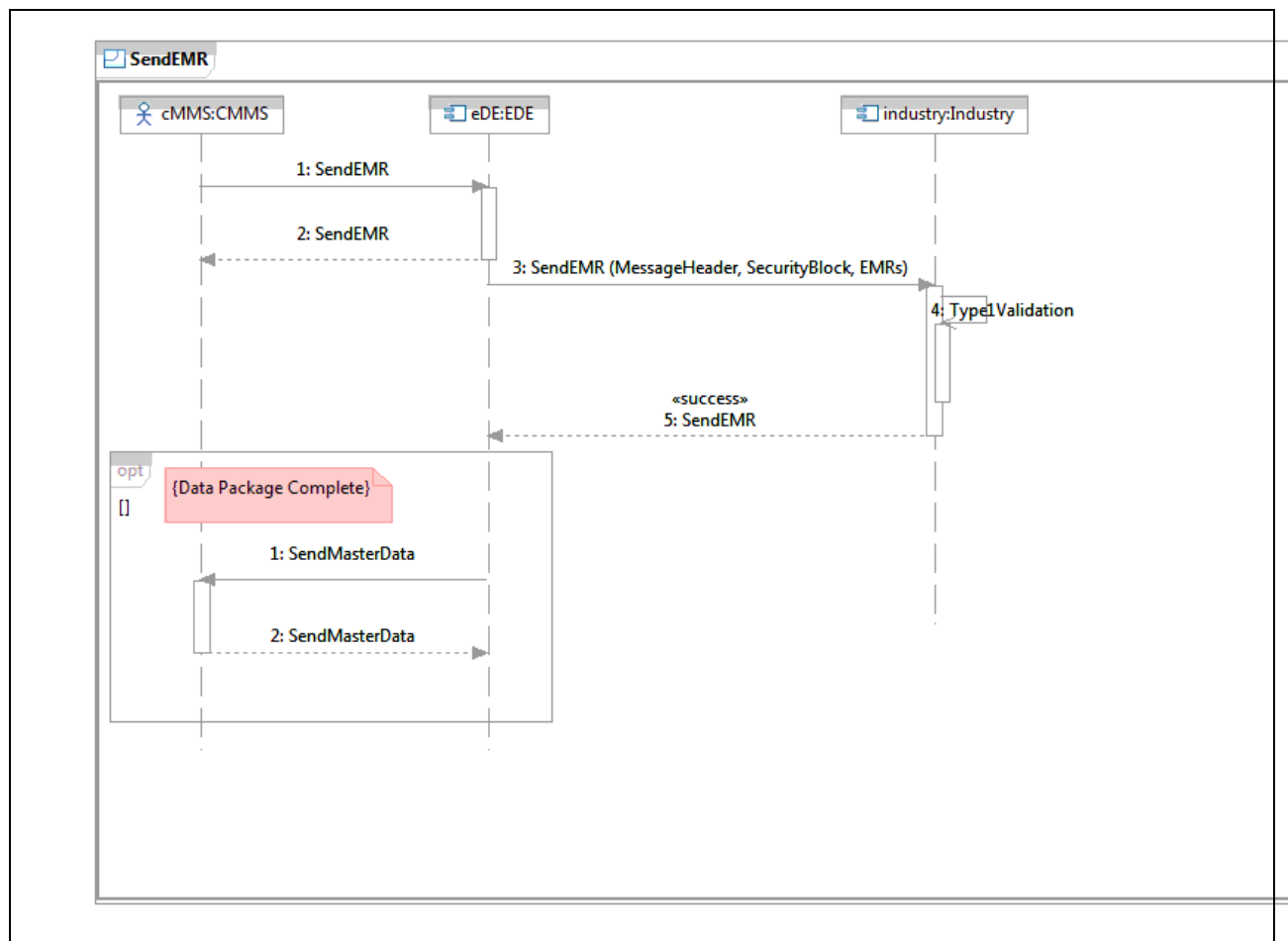


Figure 4-1 EMR Message Flow

| Main Flow | |
|----------------|--|
| Scenario | “Happy Day:” Canada EDE successfully sends EMR business objects to Industry. |
| Pre-Condition | Canada has prepared a data package containing one or more EMR business objects. Canada EDE has received initiation request and responded with creation of unit of work and manifest. Industry has replied to Canada EDE that unit of work is successfully created. |
| Post-Condition | EMR business objects successfully received by Industry. |

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| | |
|-------|--|
| Steps | <ol style="list-style-type: none">1) CMMS sends EMR message to Canada EDE.2) Canada EDE returns a “success” response to Canada CMMS.3) Canada EDE invokes ‘SendEMR()’ operation passing UOW ID and one or more EMR business objects. (See Input Body definition.) Canada EDE waits for technical response.4) Industry initiates “Type 1” validation. In this scenario there is no error. Industry accepts “custody” of the EMR business objects in the message.5) Industry returns to Canada EDE a “success” technical response for the SendEMR() operation. (See Output Body definition.)<ol style="list-style-type: none">a. Industry begins internal processing of the message. In this scenario there is no error.b. Industry saves EMR business objects for processing once unit of work is complete. <p>Once Industry has received a complete data package from Canada EDE, Industry will process the received data.. The details of this process are out of scope of this specification.</p> |
|-------|--|

Please see Data Package Service Specification [Ref. 5] for the scenario of confirmation from Industry Master Data has been deployed to operations.

4.3 Alternate Scenarios

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

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

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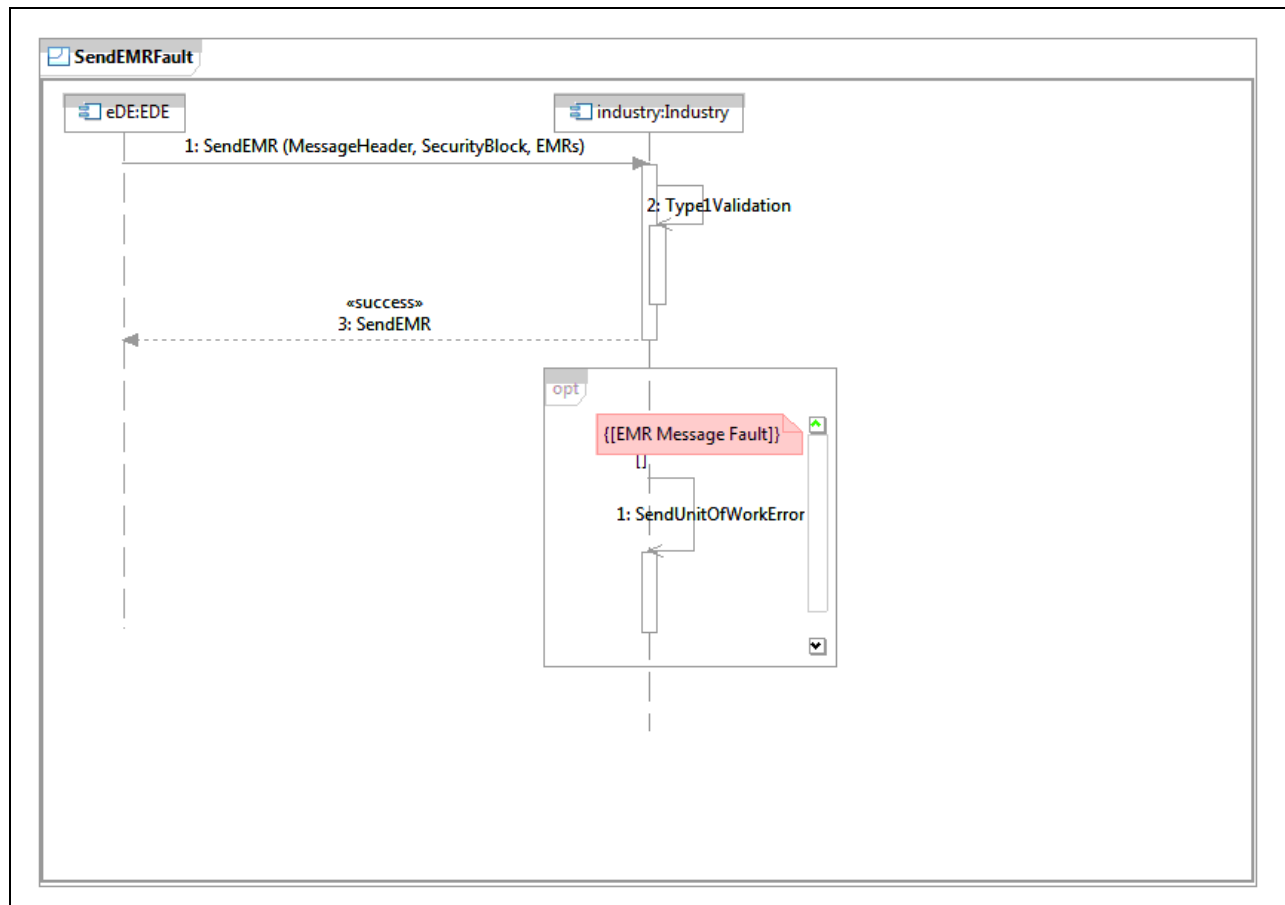


Figure 4-2 EMR Message Flow with Type 1 Error

| Alternate Flow 1 | |
|------------------|--|
| Scenario | Type 1 Errors detected by Industry prior to accepting custody of the message. Detailed specification of Type 1 errors are in Service Interaction Model [Ref. 2]. |
| Pre-Condition | Same as main Flow. |
| Post-Condition | Industry sends technical response containing a fault message to Canada EDE. Canada EDE ceases sending Master Data (of any exchange type) for this unit of work. |

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| | |
|-------|--|
| Steps | <ol style="list-style-type: none">1) Canada EDE invokes 'SendEMR()' operation containing one or more EMRs.2) Industry checks for Type 1 errors – an error is found;3) Industry constructs the fault message and sends the fault message to Canada EDE in the technical response to the original SendEMR() operation invocation. (See Fault Body definition.) <p>In the same iteration through the loop where an EMR Message fault was found:</p> <ol style="list-style-type: none">1) Industry updates unit of work status to Invalid and deletes the Master Data received so far in the invalid unit of work. |
|-------|--|

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

| Alternate Flow 2 (Industry Service unresponsive) | |
|--|---|
| Scenario | Canada EDE does not receive technical response within ACK_TIME_INTERVAL. |
| Pre-Condition | Canada EDE has invoked the operation but does not receive the technical response within the time specified for the EMR 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 response from Industry within the allowed ACK_TIME_INTERVAL.2) Canada EDE will retry sending the message up to the defined maximum retry count and/or Time to Live interval.3) If there is no response, then Canada EDE marks the request message as Dead and handles it via the Dead Message protocol (See Service Interaction Model [Ref. 2]). |
| Alternate Flow 3 (Industry Business Error) | |
| Scenario | Industry reports a business error when attempting to load one or more Master Data business objects. |
| Pre-Condition | All business objects have been received by Industry, and Industry starts its data load process. |
| Post-Condition | Industry sends technical problem through TPMS interface to Canada EDE. |
| Steps | <ol style="list-style-type: none">1) Industry invokes Canada EDE TPMS operation and receives a positive technical response. |

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5 Service Description – Equipment Master Record Service

5.1 Service Overview

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

As part of the Equipment Master Record service Canada EDE will implement and expose two operations:

- An error reporting operation used by Industry to report technical errors (Section 4, Alternate Flow 2) and business errors (Section 4, Alternate Flow 4);
- An acknowledgement service optionally⁶ used by Industry to report successful delivery of EMR business objects to Canada EDE.

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

5.2 Service Properties

| Service Property | Description |
|-------------------------------------|---|
| Enterprise Service Name (Business) | Equipment Master Record Service |
| Enterprise Service Name (Technical) | EquipmentMasterRecordService_Industry (Abbreviated in this document to EMR service.) |
| Purpose | This service supports the Canada EDE Master Data, Maintenance History and Supply business processes. On the occurrence of business triggers, Canada EDE uses this service to send EMR messages to Industry. |
| 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 | SendEMR() - Industry SendEMRAck() – Canada EDE SendEMRError() - Canada EDE |

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



| Service Property | Description |
|-------------------------------------|--|
| Target Service Consumers | SendEMR() - Canada EDE SendEMRAck() – Industry SendEMRError() – Industry |
| Business Process Supported (now) | Master Data processes: <ul style="list-style-type: none">• Send Platform Data to ISS Contractor; |
| Business Process Supported (future) | None currently identified. |
| Business Objective Supported | See Section 2: Business Information . |
| Expected life time | The full lifecycle of the subject weapons system. |

5.3 'SendEMR()' Operation

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

5.4 'SendEMRAck()' Operation

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

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

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5.5 'SendEMRErrorQ' Operation

This operation is used by Industry to send an error message to Canada EDE after internal message processing detects a Type 2 error condition (see Service Interaction Model [Ref. 2]). The specific EMR business objects which are in error are identified by a list of business identifiers (see Section [7](#)). Canada EDE's implementation of this operation will perform Type 1 validation on the error message. Canada EDE will return a technical response to Industry.

6 Information Model

This section describes the **business objects** which are used in the EMR service. The Unified Modeling Language (UML) notation is used. A functional view⁷ of the information model is provided in the Master Data Business Guidelines [Ref. 3] and the Business Use Case [Ref. 6].

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 EMR

An Equipment Master Record business object is used to represent:

- i. the serialized parts which are physically part of a WS;
- ii. calibrated tools or other equipment subject to life, maintenance or installation tracking.

An EMR always references a specific MMR which defines the physical type of the part represented by the EMR.

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

The class EquipmentMasterRecord *has* one or two Desc fields and different languages may be used⁸ as indicated by the <<lang>> stereotype.

The class EquipmentMasterRecord contains a serial number which distinguishes an EMR from other EMRs based on the same MMR. The description field(s) allows for extra information for Canada staff using CMMS. There may be one or two descriptions and different languages may be used⁹.

EquipmentMasterRecord contains two instance of MMR ID:

- **mandatory** MMR field pointing to the MMR of the EMR;
- optional BillOfMaterial field pointing to the MMR of the BOM header;

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 “As-Built” physical structure is represented through the ‘Parent’ link, which may be to a parent FLOC or a parent

⁷ The Functional View details the collection of fields which make up EMR business objects.

⁸ The language(s) to be used are determined between DND and Industry. Language tags are based on www.w3.org standards.

⁹ The language(s) to be used are determined between DND and Industry. Language tags are based on www.w3.org standards.

EMR. The 'Parent' link is also relevant for Maintenance History Install/Uninstall events, indicating the relevant object the EMR was installed into, or removed from.

If the EMR represents the top-level WS itself then it is also described as a Master Equipment Record (MER). The class MER_ID represents a unique name for the MER/WS and is only populated for the top level EMR (i.e., the MER).

The class Installation is only applicable in a Maintenance History context, and contains information relevant to the EMR Install or Uninstall activity.

The class EquipmentMasterRecord also has references to three code tables:

- Location –represents a high-level view of major subsystems of the WS;
- CatalogProfile –a classification used in reporting;
- EquipmentObjectType –represents equipment’s functional type.

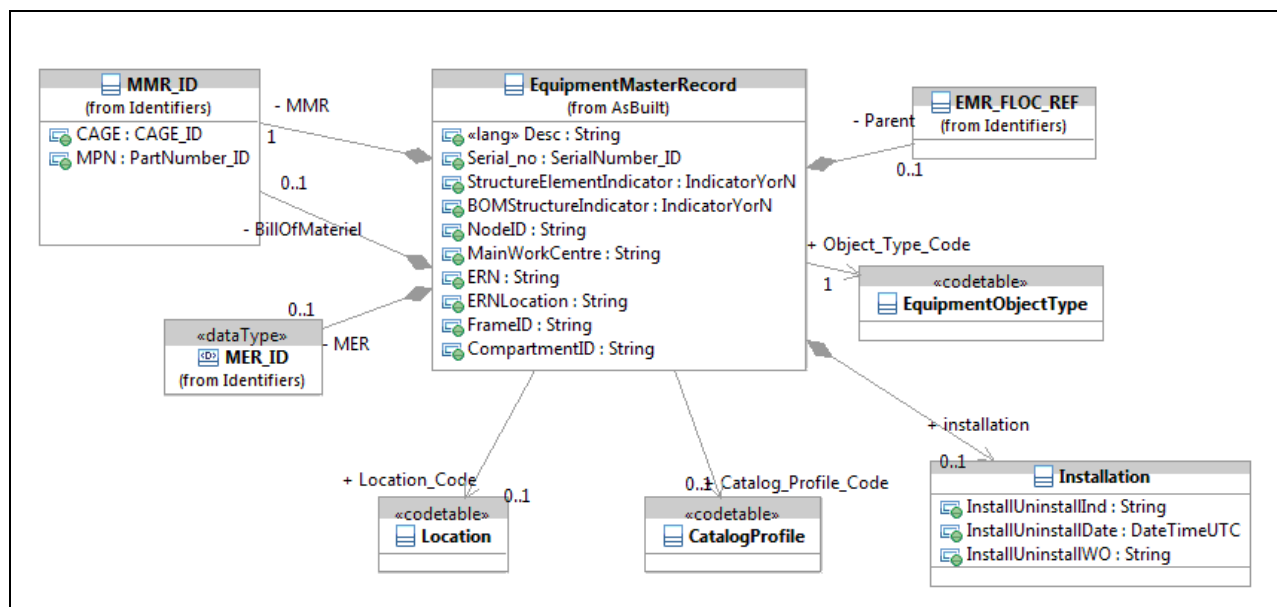


Figure 6-1 Information Model – Equipment Master Record

6.2 As Built Structure

The Equipment Master Record 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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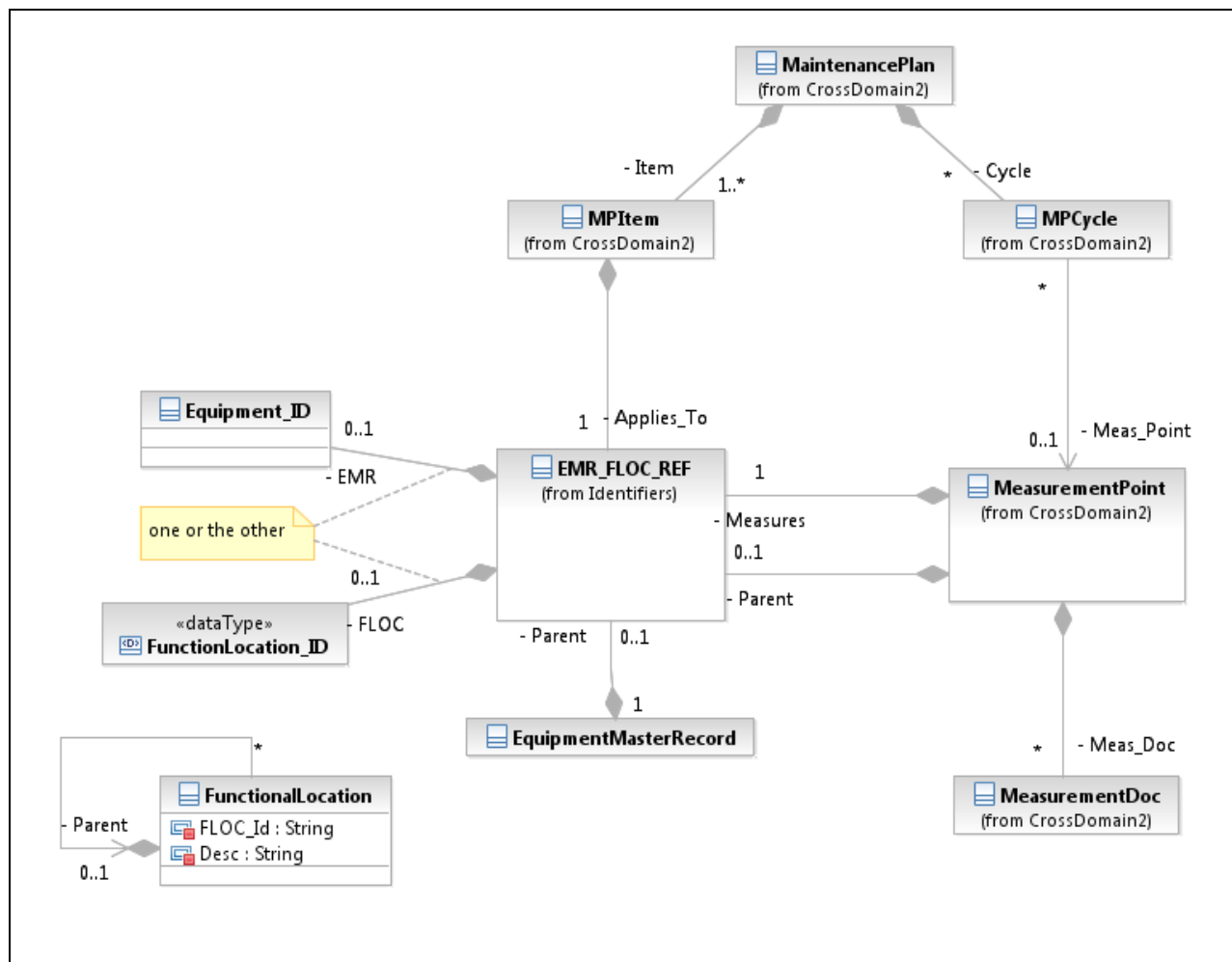


Figure 6-2 Information Model – As Built Structure

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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 ISSCF information exchange.

All Master Data services follow the request/response model and each operation definition includes a distinct input, output and fault message. See Service Interaction Model [Ref. 2] for definition of the common MessageHeader and SecurityClassification elements. BusinessContext allows Canada EDE to include contextual information with an input message. The 'Purpose' field is a value agreed between Canada EDE and Industry and may affect handling of the message. The remaining fields are populated by Canada EDE and may be replayed in error messages¹⁰.

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 EMR 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 EquipmentMasterRecord.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 EMR Input Body

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

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



¹⁰ Business Context is further discussed in the Unit of Work service specification.

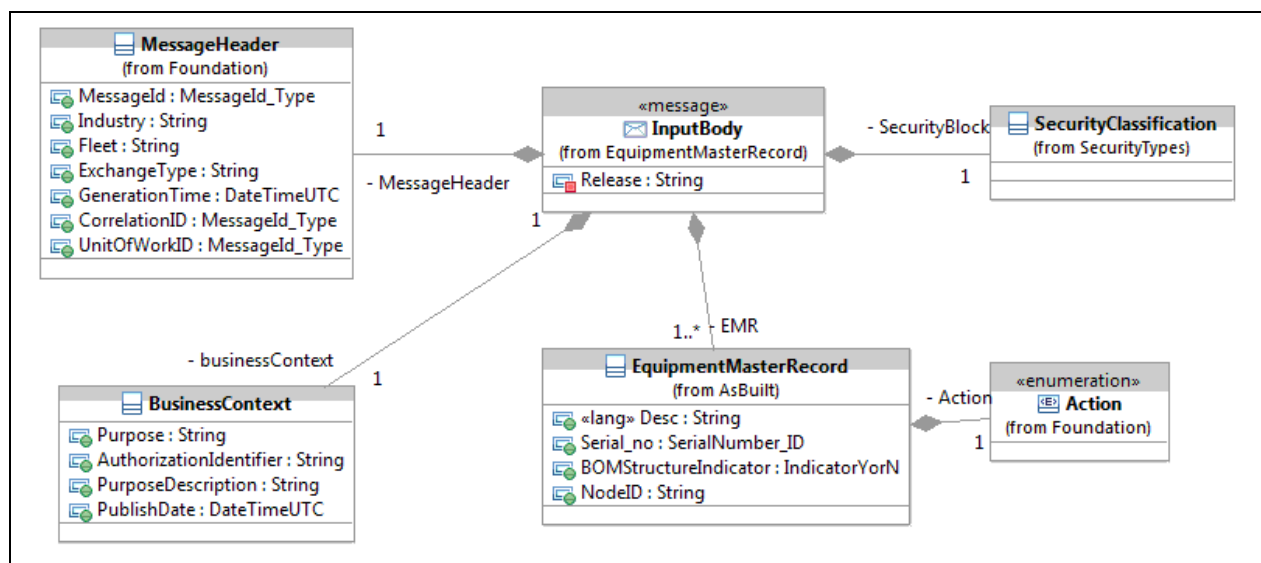


Figure 7-1 EMR Input Body

The MessageHeader UnitOfWorkID must equal the UnitOfWorkID value of an existing valid unit of work.¹¹ The MessageHeader CorrelationID must equal the MessageId of the UnitOfWork message. Purpose and ContextDescription fields must match the corresponding fields in the Unit of Work which envelopes this input message.

The EMR InputBody also contains an attribute 'Release' which designates the release of the EMR 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 released¹².

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 EMR 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 EMR Output Body

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

- A Message Header;
- A Custody object.

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

¹¹ Type 1 validation will check if the unit of work is in a non-error state.

¹² The rules for incrementing the 'Release' attribute for a service will be in a separate document.

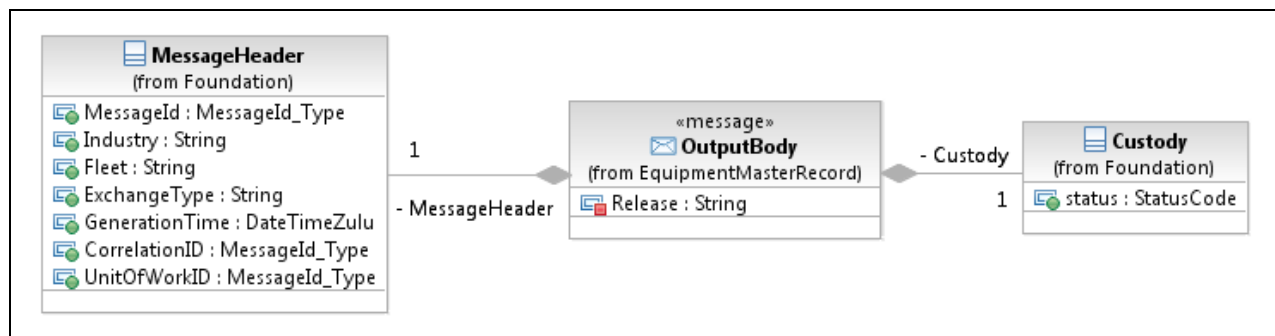


Figure 7-2 EMR Output Body

For an EMR OutputBody:

- The MessageHeader MessageId is a **new** unique value;
- The MessageHeader GenerationTime is the time the **output** message is generated;
- The MessageHeader CorrelationID is set to the MessageId of the EMR Input Body;
- The MessageHeader ExchangeType must be set to the ExchangeType of the EMR InputBody;
- The value of the Custody status field is “success”¹³.

7.3 EMR Fault Body

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

¹³ As stated in Section 5.3, the main significance of the output is that, by its presence, there is no fault.

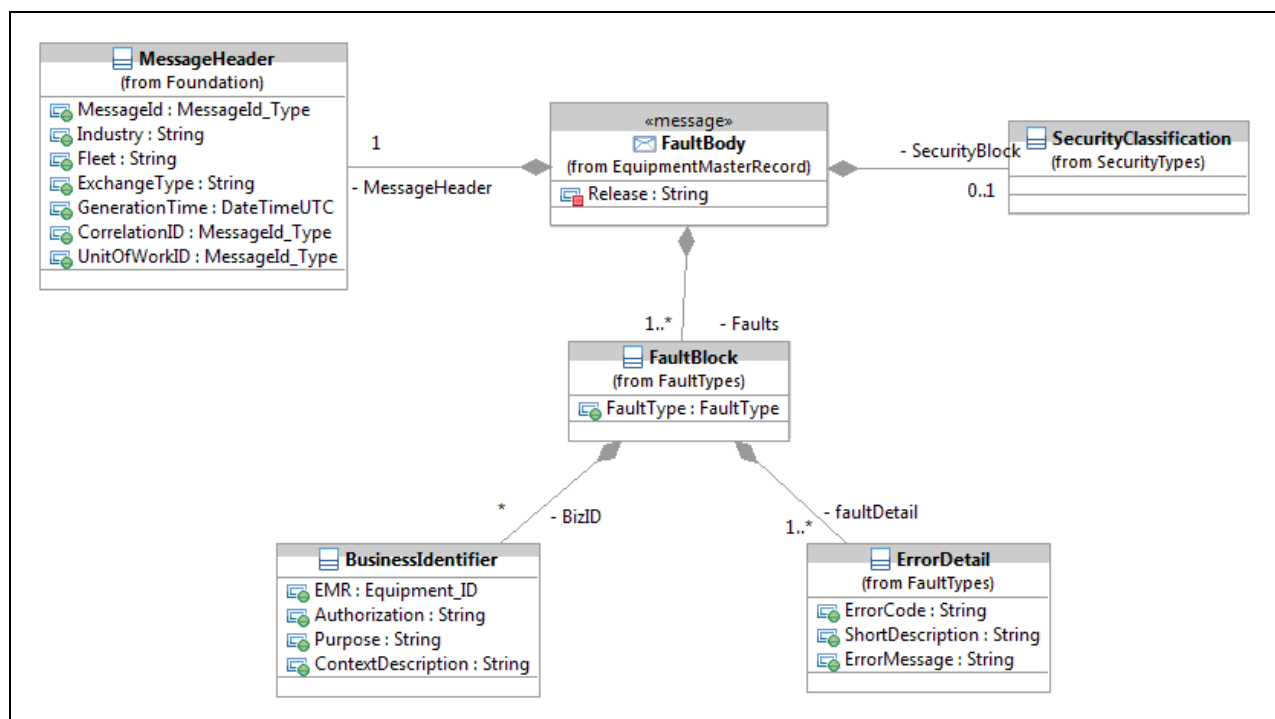


Figure 7-3 EMR Fault Body

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 EMR Acknowledgement Input Body

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

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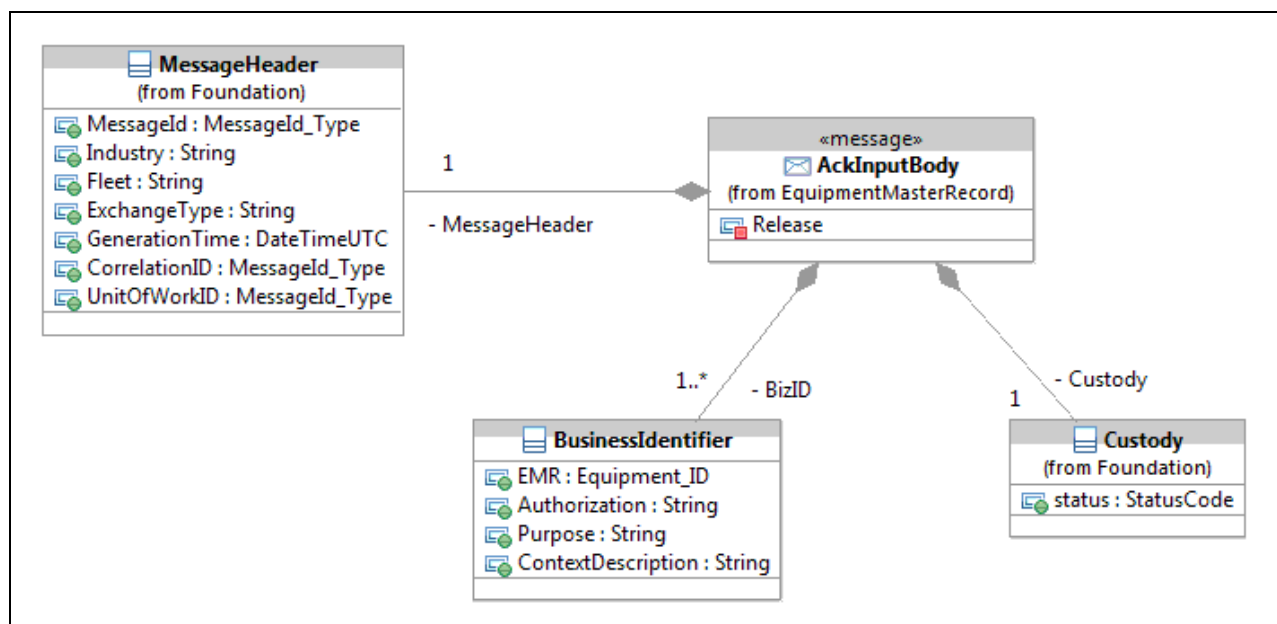


Figure 7-4 EMR Acknowledgement Input Body

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

7.5 EMR Error Input Body

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

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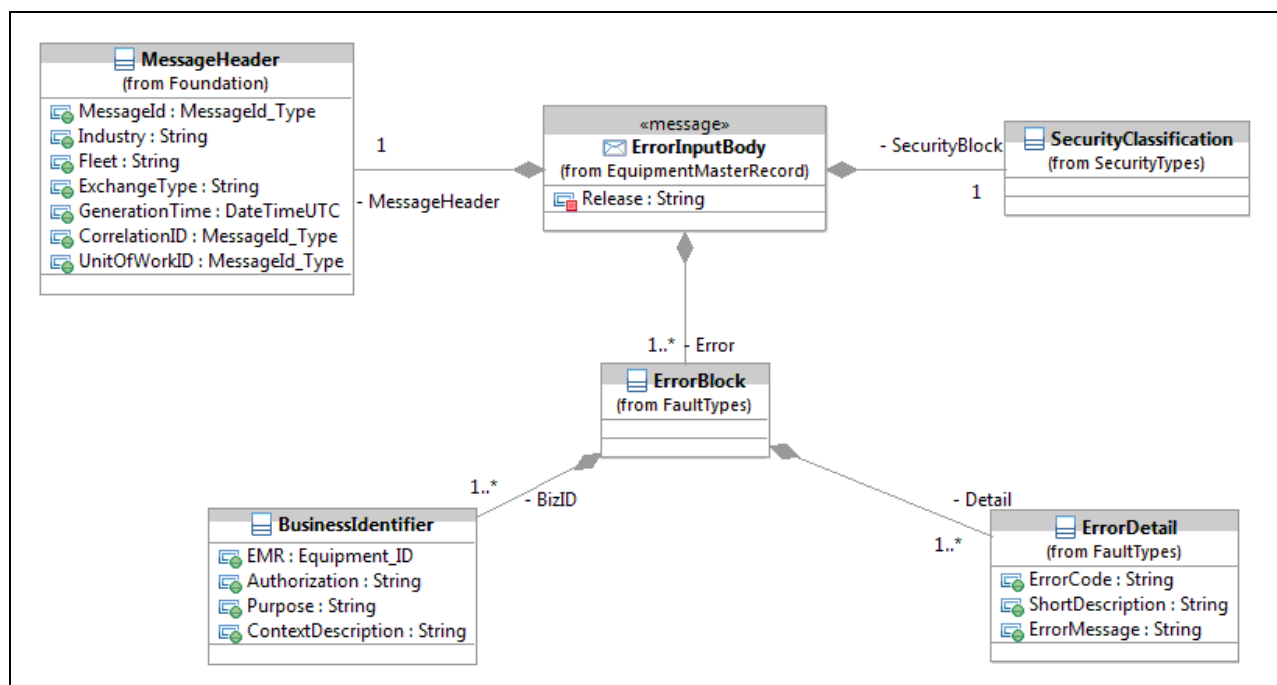


Figure 7-5 EMR Fault Input Body

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

The Message Header has a new unique MessageId.

7.6 CorrelationIDSummary 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 EMR service - SendEMR(), SendEMRack() and SendEMRError() - to their respective input, output and fault bodies as further defined in the EMR Web Service Definition Language (WSDL) file.

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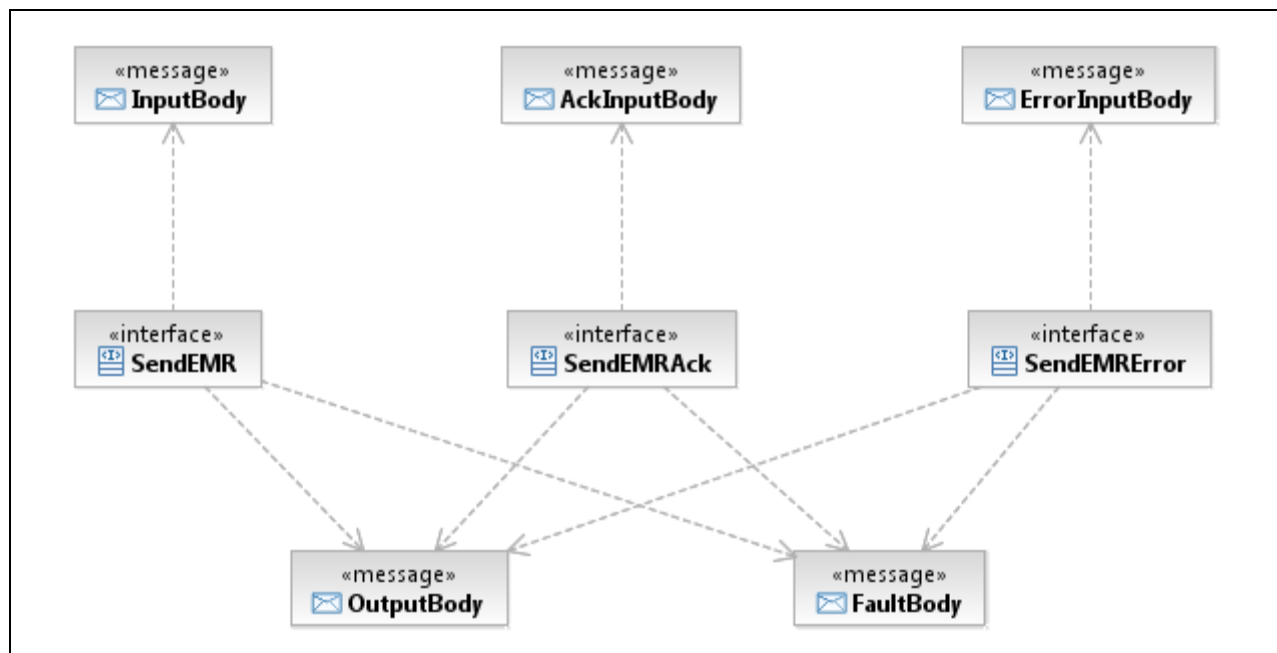


Figure 7-6 EMR Operations to Input/Output/Fault Mapping

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8 Service Operation Details

8.1 Detailed Operation Characteristics – SendEMR()

Canada EDE will invoke the exposed Industry EMR service through this operation. The input will consist of an EMR 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 Equipment Master Record WSDL files for implementation details.

Detailed Operation Characteristics

| Interface Definition | Description |
|---------------------------|--|
| Operation Name | Send EMR |
| Operation Technical Name | SendEMR() |
| Operation Description | This operation is invoked by Canada EDE to send one or more EMR business 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 7.1 EMR Input Body for details. |
| Output Message Definition | Please refer to Operation Message Model Section 7.2 EMR Output Body for details. |
| Fault Definition | Please refer to Section 7.3 EMR 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 Canada EDE cannot successfully send EMR business objects to Industry. See Service Interaction Model [Ref. 2]. |

8.2 Detailed Operation Characteristics – SendEMRError()

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

Refer to Equipment Master Record WSDL files for implementation details.

Detailed Operation Characteristics

| Interface Definition | Description |
|--------------------------|----------------|
| Operation Name | Send EMR Error |
| Operation Technical Name | SendEMRError() |

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| Interface Definition | Description |
|---------------------------|--|
| Operation Description | This operation is invoked by Industry to send one or more EMR errors to Canada EDE in a Supply Materiel or Maintenance History context. This operation is not used for Master Data context. |
| 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 7.5 EMR 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 EMR Output Body for details. |
| Fault Definition | Please refer to Section 7.3 EMR 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 SendEMR() operation. Worst case is one error per EMR business object. |
| Peak Throughput Time | Same as SendEMR() operation. |
| Peak Throughput Volume | Same as SendEMR() 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 Canada EDE cannot successfully send EMR business objects to Industry. See Service Interaction Model [Ref. 2]. |

8.3 Detailed Operation Characteristics – SendEMRAck()

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

Refer to Equipment Master Record WSDL files for implementation details.

Detailed Operation Characteristics

| Interface Definition | Description |
|---------------------------|--|
| Operation Name | Send EMR Acknowledgement |
| Operation Technical Name | SendEMRAck() |
| Operation Description | This operation is invoked by Industry to send one or more EMR acknowledgement objects to Canada EDE in a Supply Materiel or Maintenance History context. This operation is not used for Master Data context. |
| 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 7.4 EMR Ack Input Body for details. |
| Output Message Definition | Please refer to Operation Message Model Section 7.2 EMR Output Body for details. |
| Fault Definition | Please refer to Section 7.3 EMR 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 Canada EDE cannot successfully send EMR business objects to Industry. 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 Equipment Master Record Service WSDL file for the precise binding.

8.4.2 SOAP Over JMS

Not currently supported.

8.4.3 XML files via SFTP

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



9 Definitions, Acronyms, Abbreviations

| Term | Description |
|-------|--|
| CM | Configuration Management |
| CMMS | Canada Maintenance Management System |
| CSS | Canada Supply System |
| DND | Department of National Defence |
| DRMIS | Defense Resource Management Information System |
| EDE | Electronic Data Exchange |
| EIE | Electronic Information Environment |
| EMR | Equipment Master Record |
| FLOC | Functional Location |
| ISS | In Service Support |
| ISSCF | In Service Support Contracting Framework |
| MER | Master Equipment Record |
| MPN | Manufacturer Part Number |
| MMR | Materiel Master Record |
| PBC | Performance Based Contracting |
| SFTP | Secure File Transfer Protocol |
| SOAP | Simple Object Access Protocol |
| UTC | Coordinated Universal Time |
| WS | Weapon System |
| WSDL | Web Service Definition Language |
| XML | Extensible Markup Language |

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10 Appendix A - Entity Relationship Model

Information Model – Entity-Relationship View

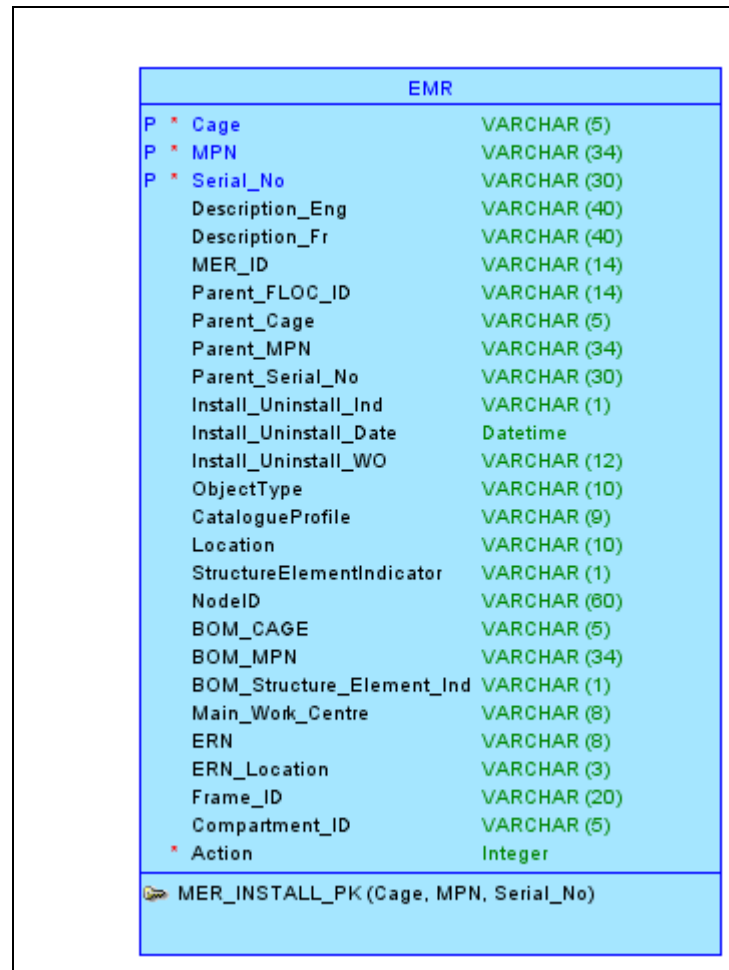


Figure 10-1 EMR ERD

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11 Document History

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