



Electronic Information Environment (EIE)

Service Specification Document/Interface Control Document

Navy Industry Work Order Specification – 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 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 Work Order messages to Canada EDE. To support the Work Order 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.

1.1 Intended Audience

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

1.2 References

- [Ref. 1] Electronic Information Environment (EIE) Business Use Case - BUC 4.27 Navy - Exchange Maintenance Work Order Data – ISS Contractor
- [Ref. 2] Annex L: Navy Maintenance Process Model – In the Context of Performance-Based Contracting (PBC)
- [Ref. 3] Electronic Information Environment Service Interaction Model
- [Ref. 4] Electronic Information Environment Industry Maintenance Services Operational Model – For Industry-performed maintenance

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2 Business Information

Business Information is based on the EIE Business Use Case for Navy Work Orders – ISS Contractor [Ref. 1].

The ISS Contractor will be responsible for conducting some corrective and/or preventive maintenance. The ISS Contractor creates a maintenance Work Order in their Maintenance Management System and sends the Work Order record to Canada once it is scheduled. Upon completion of the maintenance execution, the ISS Contractor will close its Work Orders and send the Work Order complete records to in order for DND to perform on-going maintenance on the platform following the ISS Contractor-performed work. The data received from the ISS contractor will be inducted into the CMMS.

The required data from the ISS Contractor at completion of maintenance execution activities include maintenance Work Orders for each corresponding Work Order completed as a result of ISS Contractor-performed maintenance.

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

The scope of ISS Contractor conducted maintenance will be defined and agreed to between the ISS Contractor and DND prior to the platform being transferred.

Upon completion of the maintenance work by the ISS Contractor, the ISS Contractor will declare maintenance on the platform to be complete. The required data from the ISS Contractor at completion of maintenance activities include maintenance Notifications¹ and Work Orders for each corresponding Work Order completed as a result of ISS Contractor-performed maintenance.

2.2 Business Triggers

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

- ISS Contractor creates and schedules a Work Order within their maintenance system for maintenance to be conducted on the WS.
- ISS Contractor completes maintenance activity and marks associated Work Order as completed.
- ISS Contractor completes requested deferred maintenance activity and marks associated Work Order as completed.

¹ Notifications are addressed in a separate service specification.



- ISS Contractor completes Engineering Change and marks associated Work Order as completed.

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

2.3 Business Error Processing

In the event Canada encounters business errors while attempting to post Work Order data to their backend systems, Canada will report errors on a Work Order message in one error message.

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

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3 Business Constraints

Constraints on *Usage* of the Service

- 1) Canada EDE shall ensure a Work Order message is only processed from an ISS Contractor which is properly authenticated and authorized to see maintenance and materiel data for that platform.
- 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 Work Order service shall operate in near-real time.
- 4) Canada will authorize invocations of operations of the Work Order service
- 5) Canada EDE will report any business processing errors through the Work Order Error operation.
- 6) Work Order messages will be signed using digital certificates between Canada EDE and Industry. Please see Service Interaction Model [Ref. 3] for details.
- 7) The ISS Contractor 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 Work Order 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.

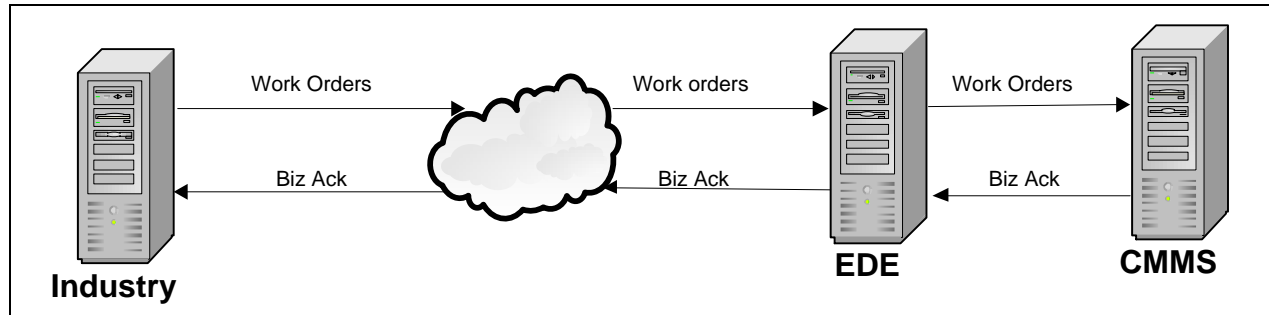


Figure 4-1 Industry Work Order Service Context

The following steps occur:

1. Industry completes agreed maintenance activity.
2. Industry generates a Work Order message.
3. Industry sends Work Order to Canada EDE – Canada EDE accepts the message and returns a ‘technical’ response.
4. Canada EDE sends Work Order to CMMS – CMMS accepts the message and returns a ‘technical’ response.
5. CMMS performs the required “back-end” processing including enforcement of pre-established business rules as per agreement with Canada-DND and Industry, and updates its Work Order records.
6. CMMS sends a Work Order ‘Biz Ack’ message indicating CMMS’ acceptance of the Work Order message sent by Industry.

The “technical response” referred to above either (i) confirms a party in the exchange has accepted a message for further processing, or (ii) contains a fault message. A technical acceptance does not preclude subsequent “business” errors 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.

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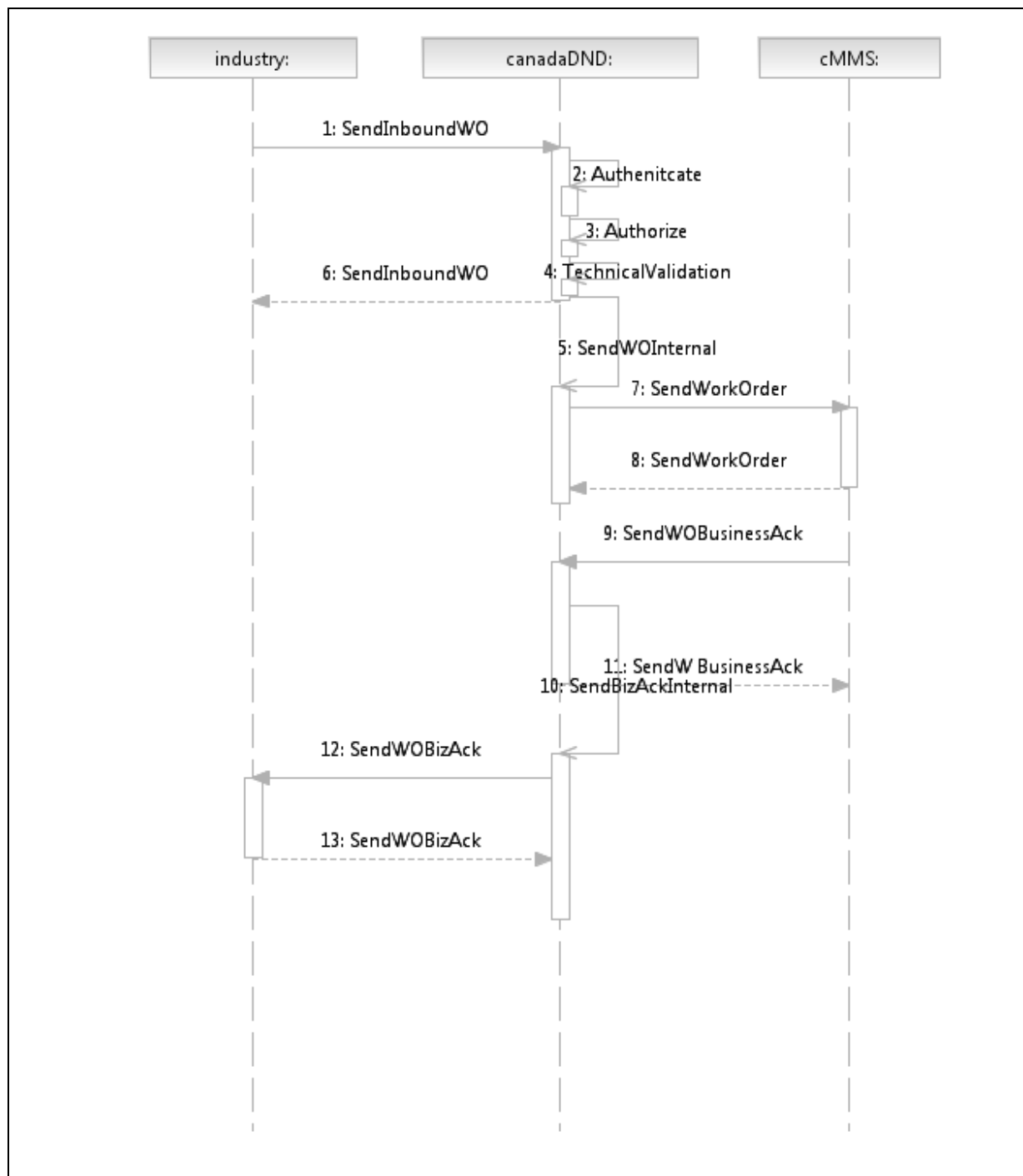


Figure 4-2 Work Order Message Flow

Main Flow

The information being provided is to illustrate the model that exists for business processes and information exchange within the Performance Based Contracting (PBC) solution for the Department of National Defence. The information is provided to facilitate an understanding of the business architecture and the solution architecture that exist for the PBC program. The content is not intended to reflect the end state specifications for all of the PBC EIE related services.



| Main Flow | |
|----------------|---|
| Scenario | "Happy Day:" Industry successfully sends Work Order to Canada. |
| Pre-Condition | Industry completes its maintenance activity. |
| Post-Condition | Work Order message is successfully received by Canada. |
| Steps | <ol style="list-style-type: none">1) Industry sends Work Order 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 validations6) Canada EDE sends technical response to Industry indicating message was accepted.5/7/8) Canada EDE invokes back-end processing in CMMS.9/10/11) CMMS sends Work Order business acknowledgement message to Canada EDE.12) Canada EDE sends Work Order BizAck message to Industry, indicating successful processing of the Work Order in CMMS.13) Industry sends technical response to Canada EDE indicating message was accepted. |

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 Work Order service. The [Work Order 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 Work Order 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. |

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| | |
|--|--|
| Pre-Condition | Industry has invoked the Canada EDE Work Order 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. |
| Pre-Condition | Industry has invoked the Canada EDE Work Order 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 Work Order 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 DeadMessageHandlerService. |

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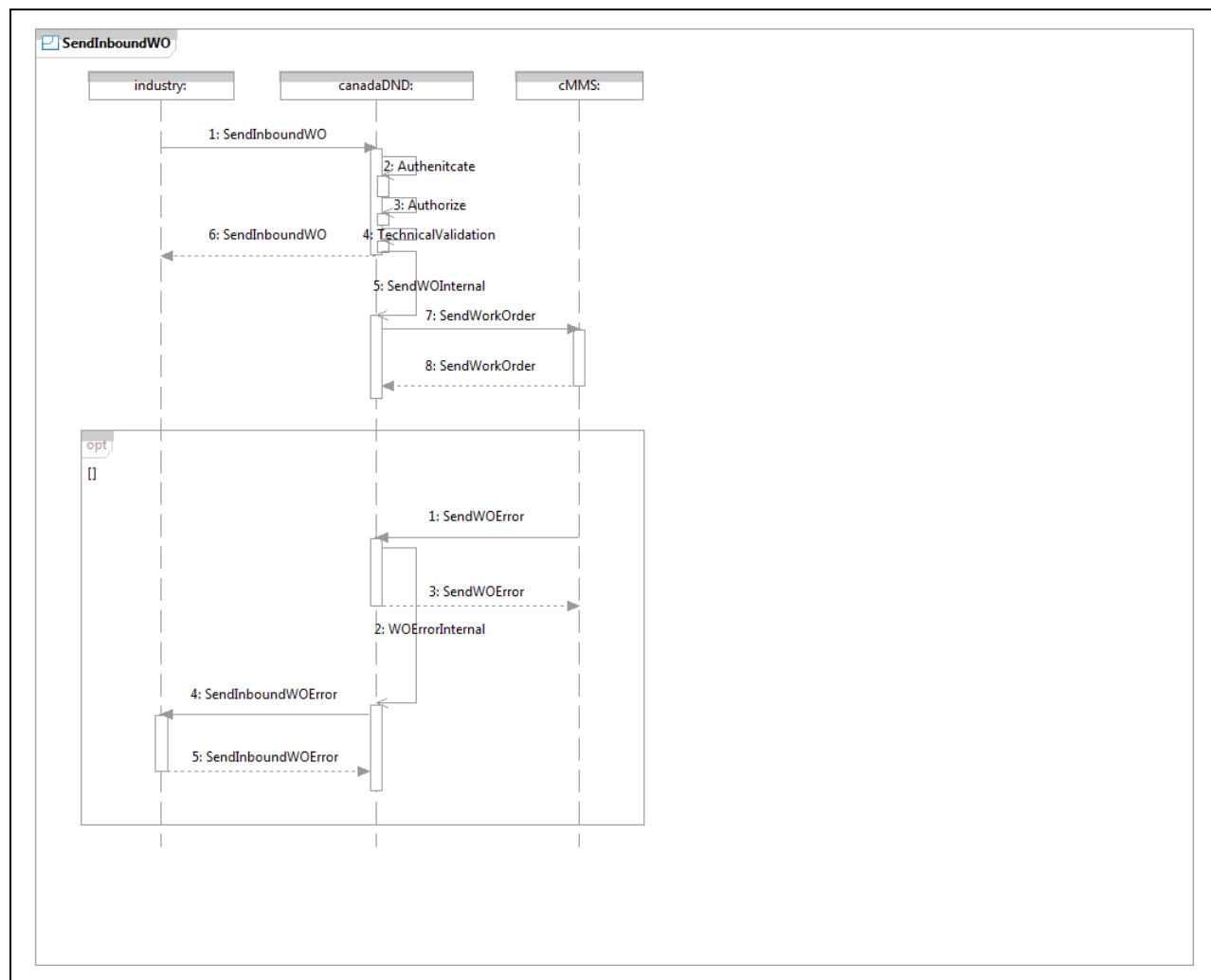


Figure 4-3 Work Order Business Validation Failure Message Flow

| Alternate Flow 5 (Business Validation Failure) | |
|--|--|
| Scenario | CMMS business validations fail on the Work Order data record. |
| Pre-Condition | Industry has invoked the Canada EDE Work Order 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. |

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| | |
|-------|--|
| Steps | <ol style="list-style-type: none">1) The Work Order data record failed CMMS's business validation process.2) Canada CMMS forwards Work Order business error message to Canada EDE.3) Canada EDE sends business error information to Industry via the Work Order Error operation exposed by Industry.4) Industry Authenticates, Authorizes and performs Technical Validation on Work Order Error message.5) Industry returns a "technical" ack to Canada EDE. |
|-------|--|

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5 Service Description – Industry Work Order Service

5.1 Service Overview

Industry Work Order service requires interacting web services exposed by Canada EDE and Industry. Canada EDE will expose a service which Industry will use to send the Work Order 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 Work Order 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 Work Order message.

5.2 Service Properties

| Service Property | Description |
|-------------------------------------|--|
| Enterprise Service Name (Business) | Work Order Service |
| Enterprise Service Name (Technical) | IndustryWorkOrderService |
| Purpose | This service supports the Canada Maintenance process for Industry-performed maintenance of Canada WS platform. On the occurrence of business triggers, Industry uses this service to send Work Order 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 – Preventive and Corrective Maintenance |
| Source Provider | Work Order – Canada DND Work Order Acknowledgement - Industry Work Order Error – Industry |
| Target Service Consumers | Work Order – Industry Work Order Acknowledgement – Canada DND Work Order Error – Canada DND |
| Business Process Supported (now) | Preventive and Corrective Maintenance <ul style="list-style-type: none">Execute Maintenance - ISS Contractor |
| Business Process Supported (future) | None currently identified. |

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| Service Property | Description |
|------------------------------|---|
| Business Objective Supported | See Section 2: Business Information . |
| Expected life time | The full lifecycle of the subject weapons system using PBC. |

5.3 Service Operations

| Provider | Consumer | Operation |
|------------|------------|------------------------------|
| Canada EDE | Industry | SendWorkOrder |
| Industry | Canada EDE | SendWorkOrderAcknowledgement |
| Industry | Canada EDE | SendWorkOrderError |

5.3.1 SendWorkOrder Operation

This operation is used by Industry to send a Work Order message to Canada EDE. Canada EDE's implementation of this operation will perform authentication, authorization and technical message validation on the Work Order 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 SendWorkOrderAcknowledgement Operation

This operation is used by Canada to send a Work Order Acknowledgement message to Industry in the event the Work Order is accepted by Canada backend maintenance system. Industry's implementation of this operation will perform authentication, authorization and technical validation on the Work Order Acknowledgement 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. If the content of the output indicates SUCCESS, Industry accepts custody of the acknowledgement. If Industry does NOT accept the message, Industry will return one or more fault blocks.

5.3.3 SendWorkOrderError Operation

This operation is used by Canada to send a Work Order Error message to Industry in the event a business error is encountered by Canada backend maintenance system. Industry's implementation of this operation will perform authentication, authorization and technical validation on the Work Order 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. If 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 Work Order message takes place.

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5.4 Message Interaction

As defined in [Section 4: Service Use Case](#), the Work Order 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 Work Order 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].

6 Information Model

This section describes the **business objects** which are used in the Work Order service. The Unified Modeling Language (UML) notation is used. A functional view² of the information model is provided in the Work Order 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 Work Order

The Work Order information model is shown in [Figure 6-1](#) below.

The Work Order must include the following information:

- External Work Order Number— ISS Contractor Work Order identifier
- Record Timestamp
- Work order Short Description
- Actual Start Date
- Actual Finish Date
- System Status
- System Status Timestamp

In addition, Operation identifiers and information on tasks performed is also expected to be provided.

This information includes:

- External Operation Identifier – ISS Contractor Operation identifier
- Operation Short Text

² The Functional View details the collection of fields which make up a Work Order.

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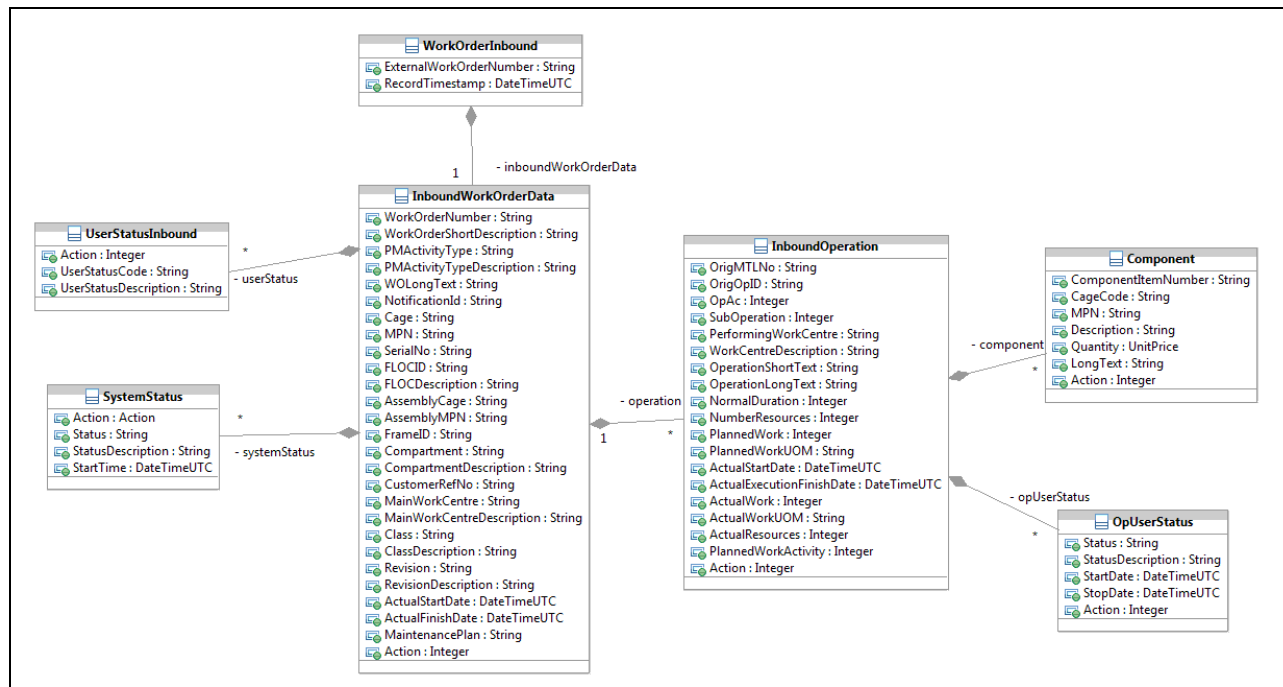


Figure 6-1 Information Model –Work Order

The 'action' attribute is discussed in [Section 7.1.1 Work Order Input Body](#).

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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.

The Industry WorkOrder service is request/response and each operation definition includes a distinct input, output and fault message. Message definitions use a common canonical 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 Industry Work Order Message Constructs

7.1.1 Industry Work Order Input Body

As shown in Figure 7-1, a Work Order input message consists of

- a Message Header;
- a Security Block;
- a Work Order.

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.

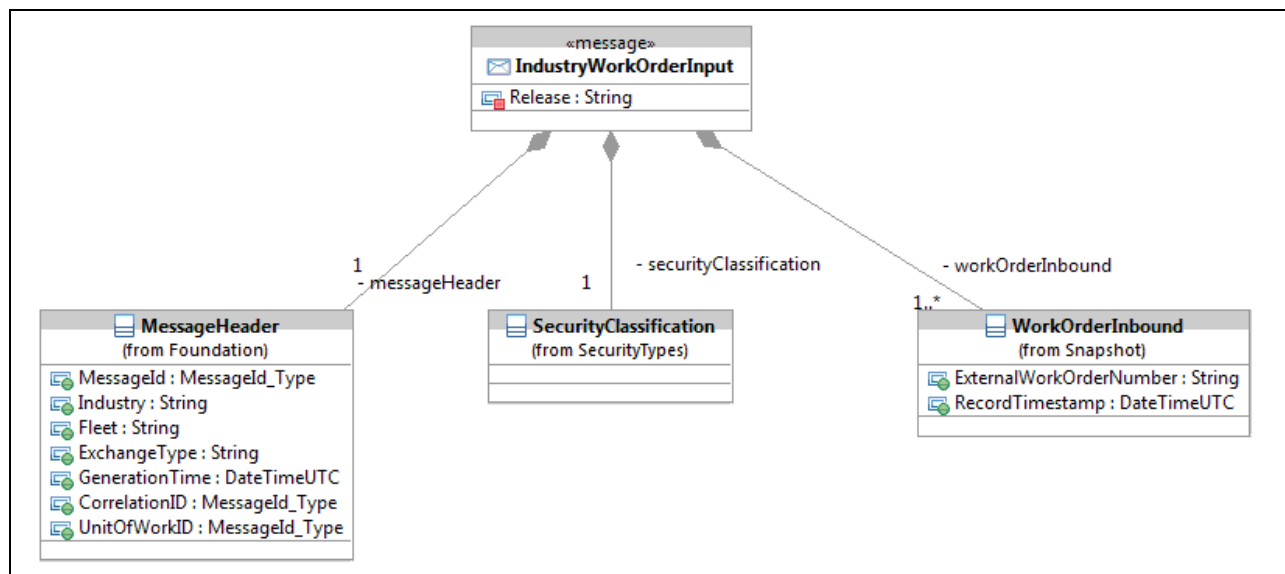


Figure 7-1 Work Order Message

For a IndustryWorkOrder Input body the MessageHeader CorrelationID and UnitOfWorkID are not used.

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Within the Work Order business object there is an attribute named 'action' which is set by the service consumer as a directive to CMMS 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;
- Snapshot at a point in time of a business object: action = 4;

7.1.2 Industry Work Order Output Message

The output of the SendWorkOrder operation is the IndustryWorkOrder Output body. As shown in Figure 7-2, the output body consists of:

- a Message Header;
- a CustodyOutput indicating acceptance; the Work Order 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 Work Order operations.

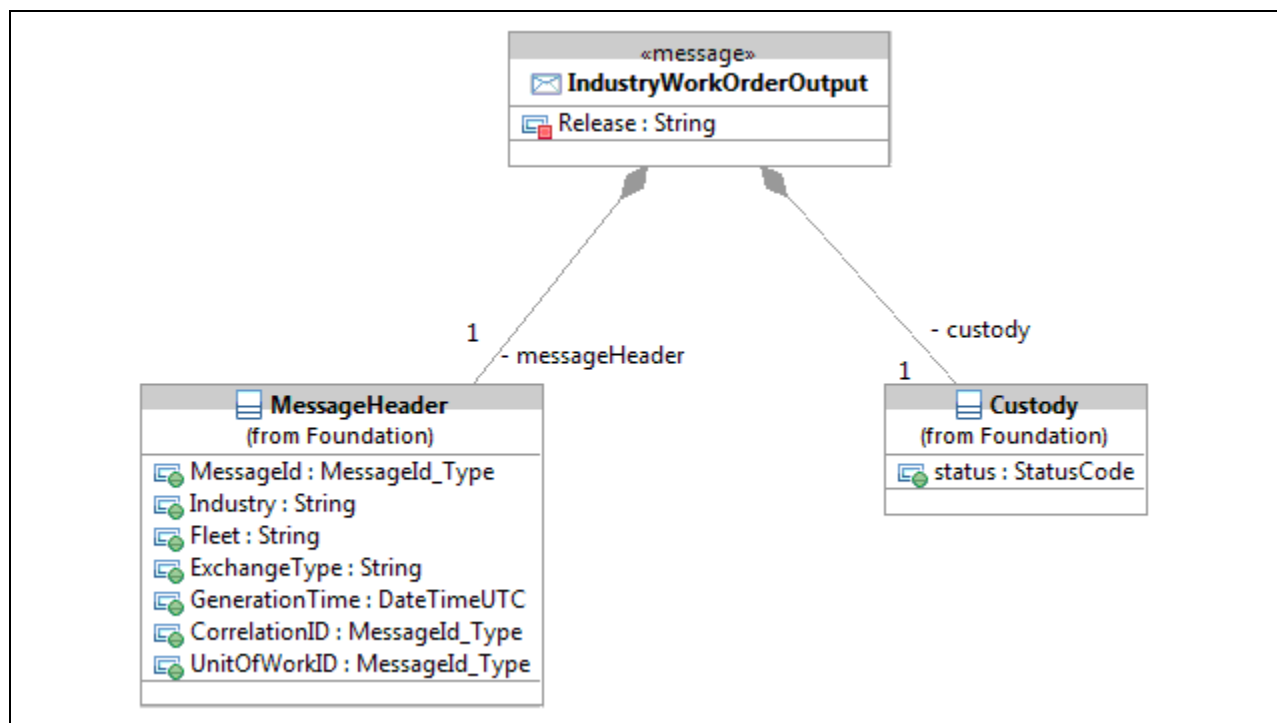


Figure 7-2 Industry Work Order Output Message

For a IndustryWorkOrder OutputBody:

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- The MessageHeader CorrelationID will reflect the MessageId of the originating Work Order input message;
- UnitOfWorkID is not used;
- The MessageHeader Exchange Type must be set to the Exchange Type of the IndustryWorkOrder InputBody;
- The value of the CustodyOutput 'status' evaluates to "success".

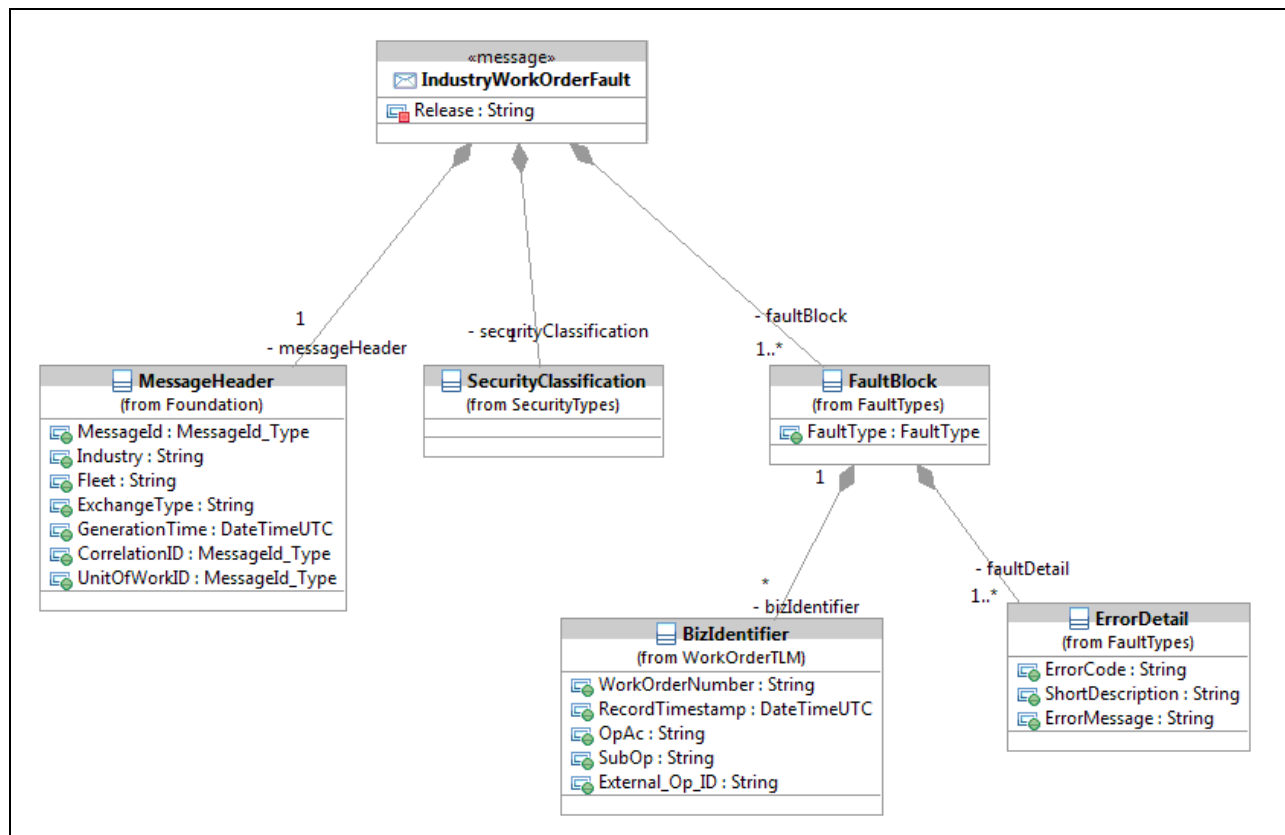
7.1.3 Industry Work Order Fault Messages

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

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

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

This fault body definition is used common all Work Order operations.



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Figure 7-3 Industry Work Order Fault Body

For an IndustryWorkOrder FaultMessage:

- The MessageHeader CorrelationID will reflect the MessageId of the originating Work Order input message.
- UnitofWorkID is not used;
- The MessageHeader ExchangeType must be set to the ExchangeType of the IndustryWorkOrderInputBody.

7.2 Industry Work Order Acknowledgement Message Constructs

Once Canada has successfully processed the Work Order in their backend maintenance system, Canada will send Industry an Industry Work Order Acknowledgement message through the following constructs.

7.2.1 Industry Work Order Acknowledgement Input Body

As shown in Figure 7-4, an Industry Work Order Acknowledgement input message consists of

- A Message Header;
- An Error Body.

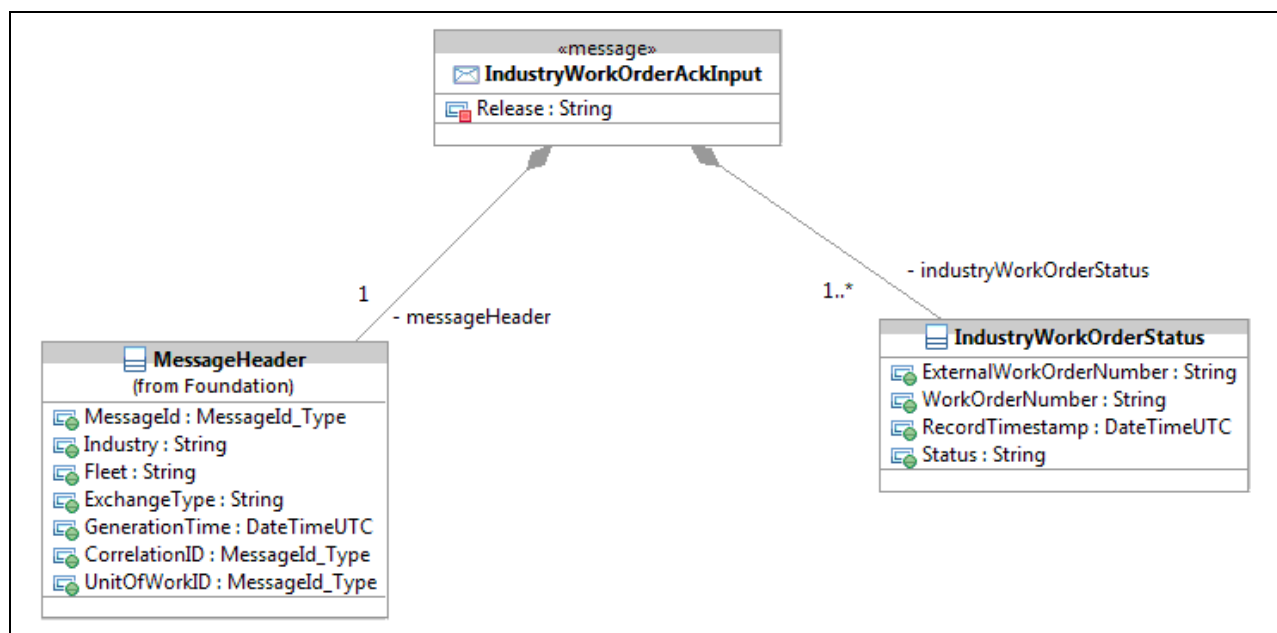


Figure 7-4 Exchange Messages – Industry Work Order Acknowledgement Input Body

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

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The fault body consists of:

- A Message Header;
- One or more Acknowledgement body.

Within the Acknowledgement Body, at least one BizID must be provided. There is no need for a security block as no business data is provided.

7.2.2 Industry Work Order Acknowledgement Output Body

Please refer to [7.1.2 Industry Work Order Output Message](#) for this definition.

7.2.3 Industry Work Order Acknowledgement Fault Body

Please refer to [7.1.3 Industry Work Order Fault Messages](#) for this definition.

7.3 Industry Work Order Error Message Constructs

In the event Canada encounters a business error while processing the Work Order in their backend maintenance system, Canada will send Industry an Industry Work Order Error message through the following constructs.

7.3.1 Industry Work Order Error Input Body

As shown in Figure 7-4, an Industry Work Order Error input message consists of

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

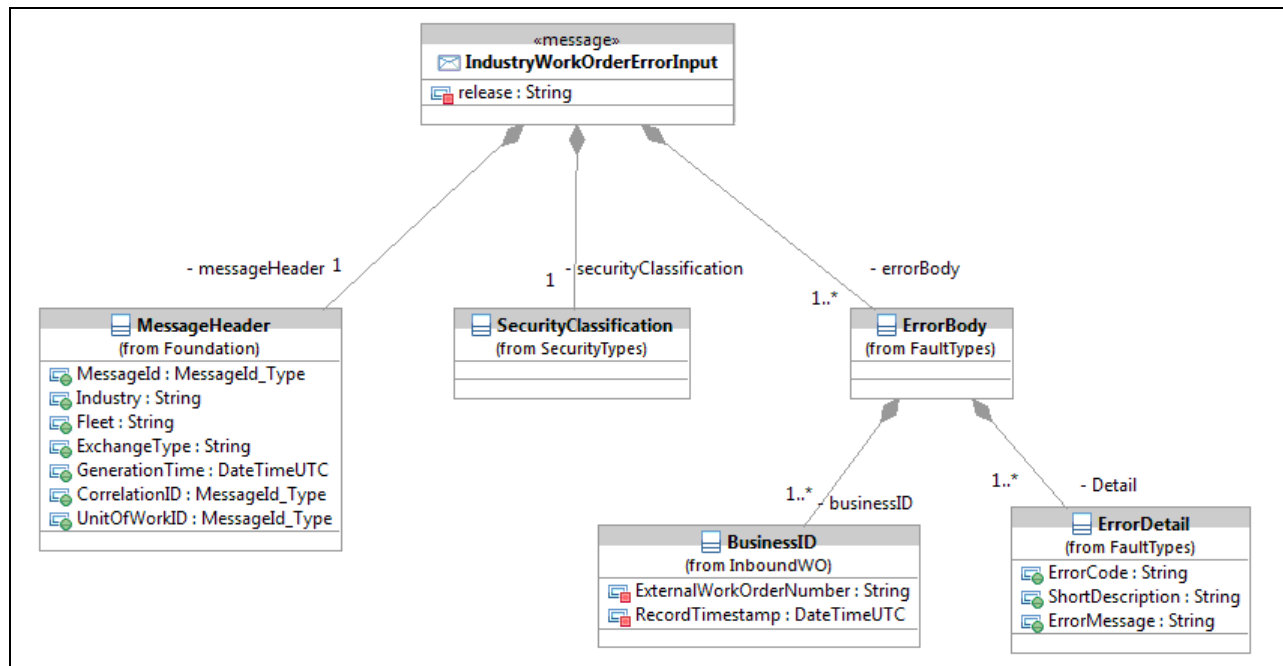


Figure 7-5 Exchange Messages – Industry Work Order Error Input Body

For a IndustryWorkOrderError 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 BizIDs 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.

7.3.2 Industry Work Order Error Output Body

Please refer to [7.1.2 Industry Work Order Output Message](#) for this definition.

7.3.3 Industry Work Order Error Fault Body

Please refer to [7.1.3 Industry Work Order Fault Messages](#) for this definition.

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8 Service Operation Details

8.1 Detailed Operation Characteristics – Send Industry WorkOrder

Industry will invoke the exposed Canada EDE Industry Work Order service through this operation. An Industry Work Order message will contain a Work Order record.

Refer to Industry_WO_Canada.wsdl for implementation specifications.

Detailed Operation Characteristics

| Interface Definition | Description |
|---------------------------|--|
| Operation Name | Send IndustryWork Order |
| Operation Technical Name | SendIndustryWorkOrder |
| Operation Description | This operation is invoked by Industry to send a Work Order 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 Industry Work Order Input for details. |
| Output Message Definition | Please refer to Operation Message Model Section 7.1.2 Industry Work Order Output for details. |
| Fault Definition | Please refer to Operation Message Model Section 7.1.3 Industry Work Order 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 access2) Unauthorized request3) Malformed message4) Service Unavailable |

Non-Functional Requirements

| Non-Functional Requirements/Technical Details | |
|---|---|
| Frequency | As required for third line maintenance. |
| Peak Throughput Time | No significant peaks are expected. |
| Peak Throughput Volume | No significant peaks are expected. |

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| Non-Functional Requirements/Technical Details | |
|---|--|
| Payload Size | ~ 50KB per Work Order |
| Attachments | None |
| Attachment Size | N / A |
| ACK Time Interval | 2 minutes |
| Retry Time Interval | 3 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- ship class 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 Work Order business objects to Canada EDE. See Service Interaction Model [Ref. 3]. |

8.2 Detailed Operation Characteristics – Send Industry WorkOrder Acknowledgement

Canada system will invoke the exposed Industry WorkOrder service through this operation. An Industry Work Order acknowledgement message will contain acknowledgments of Work Orders successfully processed by Canada backend systems, namely CMMS.

Refer to Industry_WorkOrder_Industry.wsdl for implementation details. Note that this wsdl will have two operations, one for Acknowledgements, and one for Errors.

Detailed Operation Characteristics

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| Interface Definition | Description |
|---------------------------|---|
| Operation Name | Send Industry Work Order Acknowledgement |
| Operation Technical Name | SendIndustryWorkOrderAck |
| Operation Description | This operation is invoked by Canada to send a Business Acknowledgement message to Industry. The Business Acknowledgment identifies Industry's Work Orders which were successfully processed in Canada's CMMS. |
| 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 Industry Work Order Acknowledgement Input for details. |
| Output Message Definition | Please refer to Operation Message Model Section 7.2.2 Industry Work Order Acknowledgement Output for details. |
| Fault Definition | Please refer to Operation Message Model Section 7.2.3 Industry Work Order Acknowledgement Fault for details. |

Non-Functional Requirements

| Non-Functional Requirements/Technical Details | |
|---|---|
| Frequency | Less than <i>SendIndustryWorkOrder</i> frequency. |
| Peak Throughput Time | n/a |
| Peak Throughput Volume | n/a |
| Payload Size | ~ 5KB per Error |
| Attachments | None |
| Attachment Size | N/A |
| ACK Time Interval | 2 minutes |
| Retry Time Interval | 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-ship class basis. If message cannot be delivered within 1 hour, revert to secondary delivery channel, which may be manual. |

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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 Work Order error message(s) to Canada EDE. See Service Interaction Model [Ref. 3]. |

8.3 Detailed Operation Characteristics – Send Industry WorkOrder Error

Canada system will invoke the exposed Industry WorkOrder service through this operation. An Industry Work Order error message will contain Canada-reported business errors encountered while attempting to process a Work Order message generated by Industry.

Refer to Industry_WorkOrder_Industry.wsdl for implementation details. Note that this wsdl will have two operations, one for Acknowledgements, and one for Errors.

Detailed Operation Characteristics

| Interface Definition | Description |
|---------------------------|---|
| Operation Name | Send Industry Work Order Error |
| Operation Technical Name | SendIndustryWorkOrderError |
| 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 Work Order 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 7.3.1 Industry Work Order Error Input for details. |
| Output Message Definition | Please refer to Operation Message Model Section 7.3.2 Industry Work Order Error Output for details. |

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| Interface Definition | Description |
|----------------------|--|
| Fault Definition | Please refer to Operation Message Model Section 7.3.3 Industry Work Order Error Fault for details. |

Non-Functional Requirements

| Non-Functional Requirements/Technical Details | |
|---|--|
| Frequency | Less than <i>SendIndustryWorkOrder</i> frequency. |
| Peak Throughput Time | n/a |
| Peak Throughput Volume | n/a |
| Payload Size | ~ 5KB per Error |
| Attachments | None |
| Attachment Size | N/A |
| ACK Time Interval | 2 minutes |
| Retry Time Interval | 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-ship class 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 Work Order error message(s) to Canada EDE. See Service Interaction Model [Ref. 3]. |

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8.4 Service Bindings

8.4.1 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 elements³.

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

8.4.2 SOAP Over JMS

Not currently supported for this service.

³ See the Work Order WSDL file for the precise binding



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 PBC |
| ISSC | In Service Support Contractor |
| 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

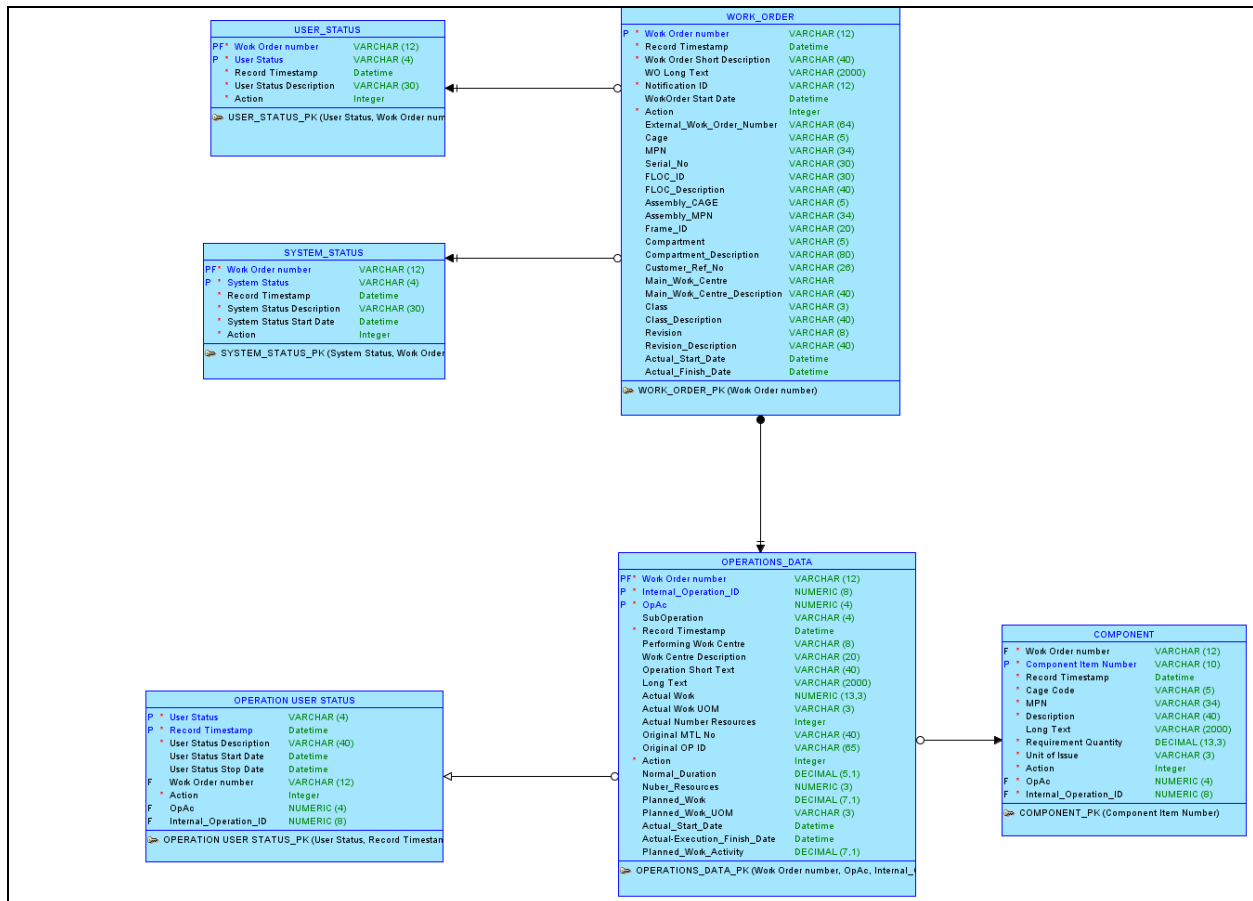


Figure 10-1 Industry Work Order ERD

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11 Document History

| Revision Number | Description | Date |
|-----------------|--------------------|-----------------|
| 1.0 | Ready for Navy RFP | 19 October 2015 |
| | | |
| | | |
| | | |

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