Electronic Information Environment (EIE)

Service Specification Document/Interface Control Document

Navy Maintenance Work Order – 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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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.

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1 Introduction

In order to fulfill its responsibilities under Performance Based Contracting (PBC), the ISS Contractor requires maintenance history information, including Maintenance Work Orders, from Canada DND.

This document defines a web-service interface between Canada DND and ISS Contractor's systems to transfer maintenance Work Order data from Canada to the ISS Contractor. To support the Work Order message exchange between Canada Electronic Data Exchange (EDE) and the ISS Contractor, both systems need to support specific web service operations as well as request and response XML schemas as described in this document.

This document defines the maintenance work order interface as three distinct services. Sections 1 through 5 apply equally to all three services; sections 6 through 10 describe individual services.

1.1 Intended Audience

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

1.2 References

[Ref. 1] Electronic Information Exchange Business Use Case - BUC 4.22 Navy Exchange Maintenance Work Order Data

Electronic Information Exchange Business Use Case - BUC 7.2 Navy - Exchange Engineering Change Work Order Data

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

Annex O: Navy Configuration Management Process Model – In the Context of Performance-Based Contracting (PBC)

[Ref. 3] Electronic Information Exchange Service Interaction Model

[Ref. 4] Electronic Information Exchange Maintenance History Service Operational Model – External

2 Business Information

Business Information is based on the EIE Business Use Case for Maintenance Work Orders [Ref. 1].

Canada Maintenance Management System (CMMS) is the system of record for maintenance history under PBC. As a result of execution of various business processes, work order records are created and modified, and their status values are updated[1]. In accordance with the PBC contract, all maintenance work orders associated with the Weapon System (WS) shall be transferred to the ISS Contractor in order to facilitate contractually agreed obligations.

On a pre-determined, periodic basis, Canada will transfer to the specific ISS Contractor partner, maintenance work order data sets through its entire lifecycle and which are permitted by the business to be shared with the specific ISS Contractor partner.

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 following business processes result in the creation or change in work order data in CMMS. Please refer to appropriate sections in Maintenance Business Process documents [Ref. 2] and Work Order Business Use Cases [Ref. 1] for details.

Functional Area: Preventive and Corrective Maintenance

- Preventive Maintenance (PM) Planning
  - PM Initialization
  - Maintenance Planning - Fleet Maintenance Facility (FMF)
- Corrective Maintenance Planning
- Execute Corrective or Preventive Maintenance
  - Execute Maintenance - Ship Staff/FMF
  - Execute Maintenance - ISS Contractor
- Cancel

Functional Area: Configuration Control

- Engineering Change Options Analysis
- Engineering Change Package Development
- Fleet Maintenance Facility (FMF) Taskings

[1] Please see the document: '*BUC 4.1 Exchange Maintenance Work Order Data*' for a functional overview of the maintenance work order information model.

2.2 Business Triggers

The following actions within CMMS, the business triggers, will result in Maintenance Work Order data being sent to Industry:

1. Creation of a Maintenance Work Order (WO).
2. Update Maintenance Work Order Start Date.
3. Update Maintenance Work Order User Status.
4. Update Maintenance Work Order System Status.
5. Close Maintenance Work Order.

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

2.3 Work Order Records and Work Order Exchange Records

The above business triggers are applied to a particular work order in CMMS. For each occurrence of a ISSCF relevant business trigger, CMMS will create a ***work order exchange record*** containing a copy (complete or partial copy) of the work order record, as defined above. A work order exchange record always contains the unique ID of its originating work order record and a timestamp when the data capture occurred. A collection of work order exchange records of the same type is called a ***work order data set***. Work Order records and Work Order exchange records diagram is shown in **Error! Reference source not found.**.

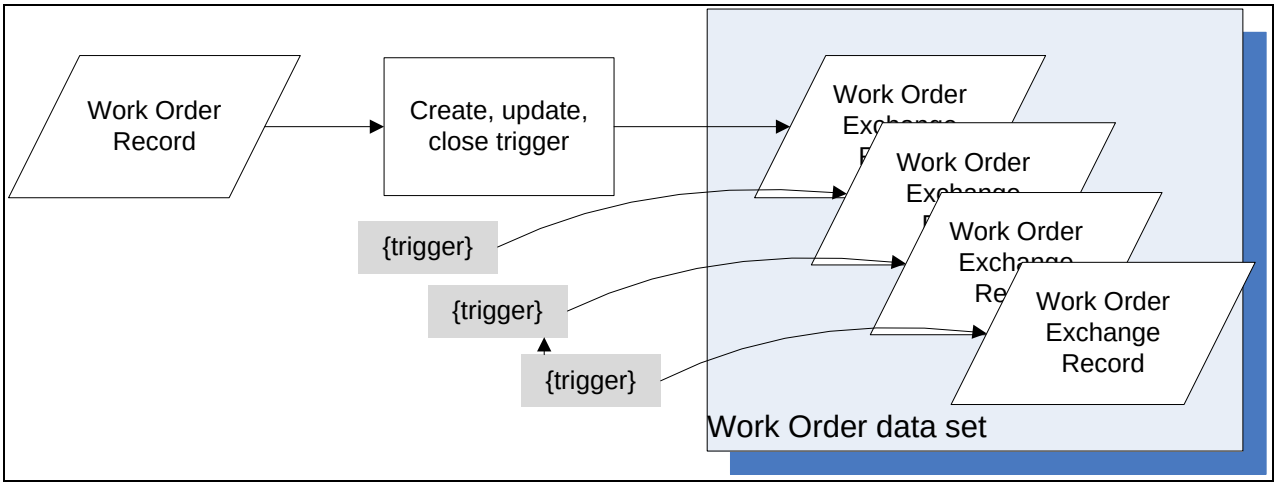


Figure 2-Work Order Records and Work Order Exchange Records

Depending upon the business trigger fired to create the work order exchange record, the work order record will follow one of the following population models:

- A fully populated Work Order object with all available data except for Goods Issue data.

- Population of Work Order User Status record only with Work Order primary key and snapshot timestamp
- Population of Work Order System Status record only with Work Order primary key and snapshot timestamp

3 Business Constraints

Constraints on *Usage* of the Service

1) The ISS Contractor Maintenance Work Order service shall only be invoked by the Canada EDE System. Canada EDE system will only invoke this service upon receiving a Maintenance Work Order message from CMMS.

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 data may be aged for a period of time – to be determined between Canada DND and ISS Contractor based on operational factors - prior to it will be released to the ISS Contractor. Please see [Ref. 2] and [Ref. 4] for details.

4) The work orders are sent on a periodic basis (for example once every day at 2:00 AM EST) as agreed upon with the ISS Contractor.

5) The Work Order data sets are sent to the ISS Contractor from the centralized CMMS server. There may be a delay incurred in the ISS Contractor receiving ship data due to the periodic nature of the decentralized CMMS server aboard ship synchronizing with the central CMMS server.

6) Since work order data sets are accumulated before being sent to the ISS Contractor, a single data set may contain more than one exchange record with the same work order ID. The records can be distinguished by their timestamp.

7) Canada DND does not guarantee that work order data sets will arrive at the ISS Contractor in the same order that they were created. It is the responsibility of the recipient ISS Contractor system to collate work order exchange records based on ID, timestamp and/or other fields.

8) Canada DND systems shall ensure Maintenance work order data set for a WS is sent only to the ISS Contractor system which is properly authenticated and authorized to see maintenance data for that fleet.

9) ISS Contractor will authorize invocations of operations of the Maintenance work order service.

10) ISS Contractor will report successful conclusion of business processing of the Maintenance work order data through the Maintenance work order Acknowledgement operation exposed by Canada using a distinct and separate invocation. In this context, successful processing constitutes the ISS Contractor successfully persisting Maintenance work order business objects within Industry system(s).

11) ISS Contractor will report any business processing errors through the Maintenance work order Error operation exposed by Canada using a distinct and separate invocation.

12) Maintenance work order messages will be signed using digital certificates between Canada EDE and the ISS Contractor. Please see Service Interaction Model [Ref. 3] for details.

13) Canada EDE may attempt to repeat operation invocations in response to technical faults. This behaviour is controlled by parameters for each operation. Please see Service Interaction Model [Ref. 3] for details.

14) The “Action” field in each record of the work order object will be defined based upon business events that have impacted the record in CMMS. The "Action" field will have the following meaning:

    1 = a new record has been created in CMMS.

    2 = the record instance has been edited within CMMS.

    3 = the record instance (defined by the record primary key) has been deleted in CMMS.

    4 = indicates that the record is a point-in-time snapshot. The record may have been added or modified since the last time the record has been sent, but the Action=4 does not imply any change; it is simply a snapshot of the current record state at the timestamp.

4 Service Use Case

The requirements for the Maintenance 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 acknowledgement and error scenarios. These are discussed in Service Use Case Scenarios.

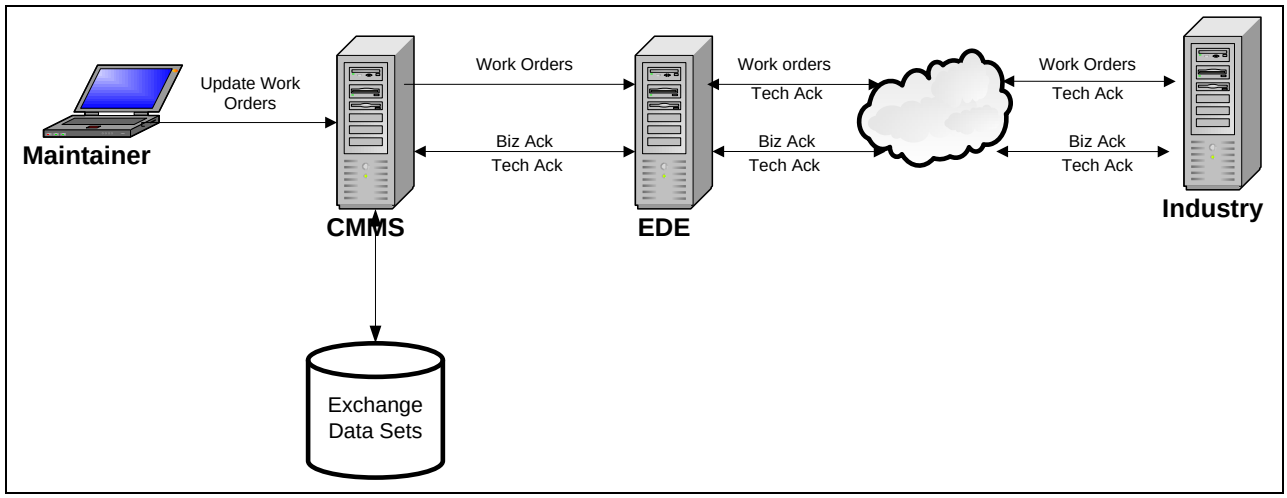


Figure 4-1 Service Context Overview

The following steps occur:

1) Maintainer (or system) actions in CMMS cause create, update, status change, and close work order events in CMMS.
2) CMMS determines the relevant work order exchange triggers and saves the applicable exchange record(s).
3) CMMS transfers applicable exchange records from decentralized CMMS server to centralized CMMS server.
4) Data sets are transferred from CMMS to EDE – with timing of the transfers based on Industry and Fleet.
5) Data sets are transferred from EDE to Industry – with timing of the transfers based on Industry and Fleet. Industry accepts the message and returns a 'technical' response, labelled as 'Tech Ack' above.
6) Industry performs their processing, including persisting work order data, and sends a business response to Canada EDE, labelled as 'Biz Ack' above. Canada EDE accepts the message and returns a 'technical' response, labelled as 'Tech Ack' above.
7) Canada EDE forwards business response to Canada CMMS system.

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 industry and reported back to Canada as required.

The "business response" referred to above either (*i*) confirms Industry has successfully persisted work order records contained within the message, or (*ii*) contains an error message.

4.2 Interaction Model

In a general scenario (as described in Use Case 1 below), Canada DND sends requests containing maintenance work order data sets to Industry. Once Industry validates the message for compliance with agreed upon XML schema (XSD file), Industry will post a technical acknowledgement message through the work order output message definition. If Industry detects an error in validating the message, Industry will post a fault to Canada through the work order fault message definition.

After some time when Industry has processed the content of the Maintenance Work Order message in their backend system(s), Industry will send a Business Acknowledgement message to the exposed Canada acknowledgement service. In a similar manner as above, Canada will post a technical acknowledgement message through the Acknowledgement output message definition.

If while processing the message content Industry backend system generates errors on the message payload, Industry will send Error message to the exposed Canada error service. In a similar manner as above, Canada will post a technical acknowledgement message through the Error service output message definition.

Please refer to Maintenance History Operation Model for various scenarios that are applicable for Maintenance History services.

4.3 Successful Request and Response

At a high level, Work Order messages are handled in the following manner:

1. Canada sends Work Order message to Industry.
2. Industry Acknowledges receipt of the Work Order message. This is referred to as a Technical Acknowledgement.
3. Industry will process the contents of the Work Order message. This may take several days.
4. After processing the contents of the Work Order message, Industry will send Canada a Business Acknowledgement message. This confirms with Canada that the accumulated Work Order data in the message is acceptable to Industry systems.

The following sequence diagram in Figure 4-2 describes steps in sending the Work Order message to Industry.

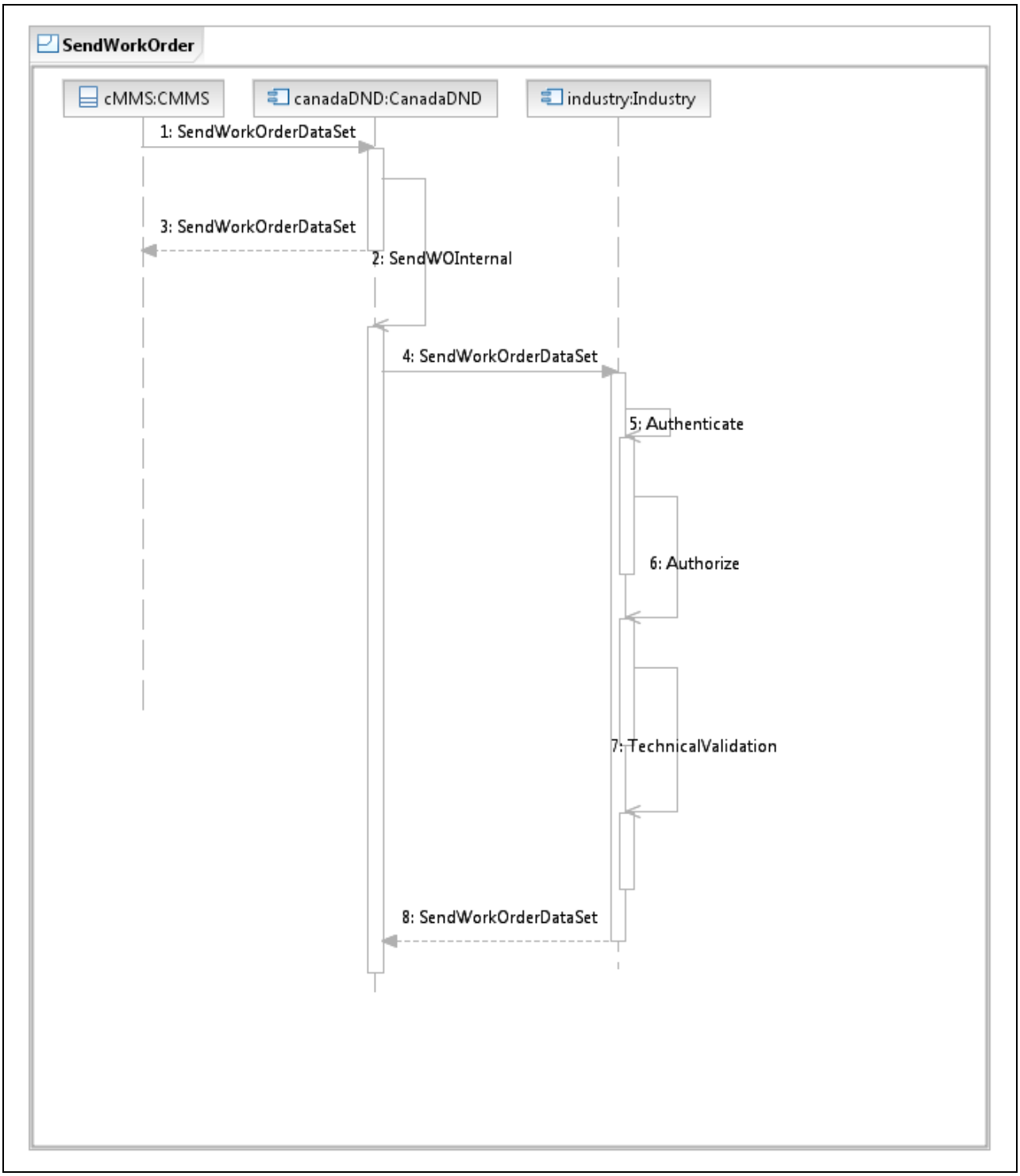


Figure 4-2 Send Work Order Sequence

The following scenarios apply to all Work Order exchange record types: Full WorkOrder snapshot, Work Order user status, Work Order system status, Work Order Operation User Status, Work Order Maintenance Task List.

Main Flow	
Scenario	"Happy Day:" Canada EDE successfully sends its Work Order data to the industry.
Pre-Condition	Work Order data is collected by the Canada CMMS system.
Post-Condition	Work Order data is successfully received by the industry.
Steps	1) CMMS sends Work Order message to Canada EDE. 2) Canada EDE successfully Authenticates, Authorizes and Validates the message; then starts an internal process. 3) Canada EDE responds that the message has been accepted. 4) The Canada EDE system invokes the Industry hosted and exposed SendWorkOrder[2] operation. 5) Industry successfully Authenticates the service consumer. 6) Industry successfully Authorizes use of the service/operation. 7) Industry conducts the required validations as per Service Interaction Model [Ref. 3]-Section Technical Delivery Phase 8) Industry provides technical response to Canada EDE. The response may indicate a status of Success or contain a fault.

Following processing of Work Order data by Industry backend systems, Industry will send a Business Acknowledgement message to Canada. This is depicted in the following sequence diagram in Figure 4-3.

[2] For this description, SendWorkOrder is a generic term encompassing any of the Work Order services: Work Order Snapshot, Work Order User Status, Work Order System Status, Work Order Operation User Status, Work Order Maintenance Task List services.

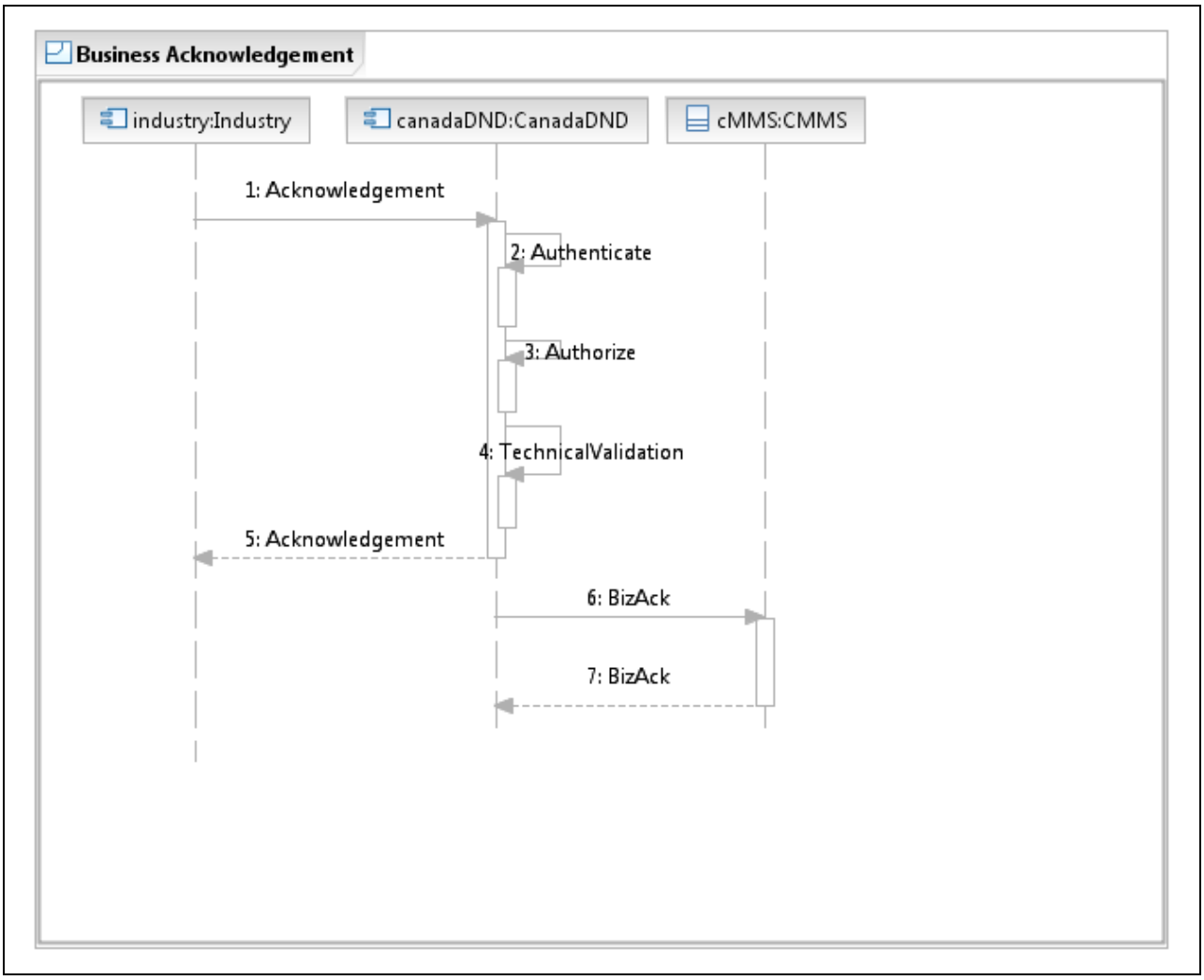


Figure 4-3 Send Work Order Business Acknowledgement Sequence

Main Flow	
Scenario	"Happy Day:" Industry successfully sends its Work Order Business Acknowledgement message to Canada.
Pre-Condition	Work Order data has been received and processed by Industry.
Post-Condition	Acknowledgement successfully received by Canada EDE.
Steps	1) After a delay[3], Industry sends *Business* Acknowledgement to Canada EDE, indicating Business Objects within the Work Order message payload were successfully processed by invoking the Canada hosted and exposed Work Order Acknowledgement operation. 2) Canada EDE successfully Authenticates the service consumer. 3) Canada EDE successfully Authorizes use of the service/operation. 4) Canada EDE conducts the required validations as per Service Interaction Model [Ref. 3]-Section Technical Delivery Phase 5) Canada EDE sends a Technical Acknowledgement to Industry, indicating successful receipt of the message. 6/7) Canada EDE sends Biz Ack message to CMMS confirming Work Order data consumed by Industry.

The following alternate scenarios are applicable for both the Work Order and Business Acknowledgment sequences presented above. Alternate Scenarios are written for the Canada-to-Industry Work Order message, but can be interpreted for Business Acknowledgement by reversing use of Canada EDE and Industry throughout.

4.4 Alternate Scenarios

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

[3] Delay may be several days while business processing of Work Order data occurs.

Steps	1) The request message does not pass Industry authorization. 2) The Industry sends an Unauthorized Request fault as the technical response. 3) Canada EDE processes the authorization failure.
Alternate Flow 3 (Technical Validation Failure)	
Scenario	Canada EDE sends a malformed message to Industry.
Pre-Condition	Canada EDE has invoked the Industry Maintenance Work Order Service. Industry has completed Authentication and Authorization successfully.
Post-Condition	The Industry sends a Malformed Message fault response.
Steps	1) The message does not pass validation as per agreed schema. (Regardless of the number and types of errors). 2) Industry sends schema validation error information as the technical response as the fault message as defined within the exposed interface. 3) Canada EDE processes the schema validation error.
Alternate Flow 4 (Business Validation Failure)	
Scenario	Business validations fail on one or more Work Order data records.
Pre-Condition	Main Flow (as above) has been completed. Work Order data records failed the Industry system's business validation process.
Post-Condition	The Industry System invokes Canada's Business Error Service.
Steps	1) Industry sends Business Error information by invoking the corresponding Canada Work Order Error service.
Alternate Flow 5 (Industry Service unresponsive)	
Scenario	Canada EDE does not receive technical response within ACK_TIME_INTERVAL
Pre-Condition	Canada EDE has invoked the Industry Maintenance Work Order Service.
Post-Condition	Canada EDE marks the request as Dead Message.
Steps	1) Canada EDE does not receive any technical response from Industry within the allowed ACK_TIME_INTERVAL. 2) Canada EDE will retry sending the message up to the defined maximum retry count, or Time to Live interval, whichever comes first. 3) If there is no response, then Canada EDE marks the request message as Dead and handles it via the DeadMessage Handler Service.

5 Information Model (General)

These services are responsible for exchange of Work Order records from Canada DND to Industry. A functional view[4] of the information model is provided in the BUC 4.2 Exchange Maintenance Work Order Data [Ref. 1].

The purpose of this section is to provide a bridge between the functional view of the information model as presented in the business use case and the specifics of the design as expressed in an XML Schema.

In general, a Work Order contains a unique Work Order ID and Record Timestamp, and instances of the following sub-record types. In these services, each of the sub-record types is *always* exchanged in the context of a parent Work Order record.

- Work Order Header
- Work Order User Status
- Work Order System Status
- Operation
- Component
- Maintenance Task List
- Operation User Status
- Operation System Status
- Goods Issue
- STE Required
- STE Assignment

A Work Order Request message adds four fields which are used by Industry to correctly process the incoming request:

- *Action* – indicates if the exchange record is new, an edit to an existing record, or a deletion of a prior exchange record;
- *RecordTimestamp* – the time the exchange record was captured in CMMS.
- *BusinessCorrelationID* – measurement extract identifier
- *BusinessSequenceNumber* – further refinement of measurement extract identifier required to ensure uniqueness

Within every Work Order request, the combination of [Work Order Number, RecordTimestamp, BusinessCorrelationID and BusinessSequenceNumber] must be unique.

Details are added in the following Service Description sections.

[4] The Business Use Case defines the collection of fields which make up a Work Order and its sub-records.

6 Service Inventory

Table 6-1 Work Order Services

Service: WorkOrderSnapshotService		
Provider	Consumer	Operation
Industry	Canada EDE	SendWorkOrderSnapshot
Canada EDE	Industry	SendWorkOrderSnapshotAck
Canada EDE	Industry	SendWorkOrderSnapshotError
Service: WorkOrderUserStatusService		
Provider	Consumer	Operation
Industry	Canada EDE	SendWorkOrderUserStatus
Canada EDE	Industry	SendWorkOrderUserStatusAck
Canada EDE	Industry	SendWorkOrderUserStatusError
Service: WorkOrderSystemStatusService		
Provider	Consumer	Operation
Industry	Canada EDE	SendWorkOrderSystemStatus
Canada EDE	Industry	SendWorkOrderSystemStatusAck
Canada EDE	Industry	SendWorkOrderSystemStatusError

The

Table 6-1 above provides the information exchange that is supported by the Work Order Business Service. Each of these services is described in the following sections.

7 Service Description- Work Order Snapshot

7.1 Service Overview

7.1.1 Work Order Snapshot (Canada to Industry)

This operation is used by Canada EDE to send a Work Order Snapshot message to Industry. Industry's implementation of this operation will perform authentication, authorization and schema validation on the Work Order Snapshot 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 message for further processing. If Industry does NOT accept the message, Industry will return one or more fault blocks.

The Work Order Snapshot includes a full representation of a Work Order, as it exists at the time of data capture. The snapshot will always include the following:

- Action - indicating whether this is a new record instance, an edit, or a delete action
- Work Order Identifier
- Record Timestamp - identifying time at which the business event triggered creation of the Work Order exchange record.
- Business Correlation ID/Business Sequence Number – used to uniquely identify a Work Order business object
- Business Context – identifying the business reason for creation of the snapshot record. Business Context is an enumerated list of the following values:

  1 => WorkOrder System Status changed;
  2 => WorkOrder Start Date Changed;

7.1.2 Acknowledgement (Industry to Canada)

This operation is used by Industry to send a Work Order Snapshot Acknowledgement message to Canada EDE. Canada's implementation of this operation will perform authentication, authorization and schema validation on the Work Order Snapshot Acknowledgement message. Canada will return a status or fault information to the consumer.

If Canada accepts the message for further processing an output message is returned. If 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.

The Work Order Snapshot acknowledgement allows Industry to report back a positive acknowledgment upon consuming the incoming Work Order Snapshot message.

For a positive (successful) acknowledgement, Industry returns the following:

- Message Header
- Work Order Identifier (including Record timestamp, Business Correlation ID, Business Sequence Number).

7.1.3 Error (Industry to Canada)

This operation is used by Industry to send a Work Order Snapshot Error message to Canada EDE. Canada's implementation of this operation will perform authentication, authorization and schema validation on the Work Order Snapshot Error message. Canada will return a status or fault information to the consumer.

If Canada accepts the message for further processing an output message is returned. If 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.

The Work Order Snapshot Error allows Industry to report back business errors encountered while processing the business objects contained within the Work Order Snapshot payload. Industry returns the following:

- Message Header
- Work Order Identifier (including Record timestamp, Business Correlation ID, Business Sequence Number)
- Errors encountered in processing.

7.1.4 Service Properties

Service Property	Description
Enterprise Service Name (Business)	Maintenance Work Order Snapshot Service
Enterprise Service Name (Technical)	MaintenanceWorkOrderSnapshot
Purpose	This service supports the Canada Maintenance process for scheduled and unscheduled maintenance tasks. This service sends work order data to the industry on a pre-negotiated schedule.
Service Domain	Maintain Platform
Business Owner	ADM (IM)
Service Grouping	Maintain Platform – Corrective and Preventive maintenance
Source Provider	WorkOrderSnapshot – Industry WorkOrderSnapshot Acknowledgement - Canada DND WorkOrderSnapshot Error - Canada DND
Target Service Consumers	WorkOrderSnapshot – Canada DND WorkOrderSnapshot Acknowledgement - Industry WorkOrderSnapshot Error - Industry

Service Property	Description
Business Process Supported (now)	Functional Area: Preventive and Corrective Maintenance • Preventive Maintenance (PM) Planning – PM Initialization – Maintenance Planning - Fleet Maintenance Facility (FMF) • Corrective Maintenance Planning • Execute Corrective or Preventive Maintenance ○ Execute Maintenance - Ship Staff/FMF ○ Execute Maintenance - ISS Contractor • Cancel Functional Area: Configuration Control • Engineering Change Options Analysis • Engineering Change Package Development • Fleet Maintenance Facility (FMF) Taskings
Business Process Supported (future)	None currently identified.
Business Objective Supported	In order for Industry to perform under the constraints of the PBC contract, Work Order history on maintenance of the supplied inventory is sent to the industry. Industry uses this information to plan their inventories based on upcoming work and analyze performance of the maintenance tasks.
Expected life time	Full life-time of weapon systems using PBC.

7.2 Information Model

7.2.1 Work Order Snapshot

A Work Order Snapshot may include the following sub-record types.

- Work Order Header data
- Work Order User Status data
- Work Order System Status data
- Work Order Operations data
- Work Order components data
- Operation System Status data
- Operation User Status data
- Work Order Maintenance Task List data
- Operation STE's Required data
- Operation STE's Assigned data

- Work Order Goods Issue data[5]

Please note that within the full snapshot, start and stop times are not sent with Work Order User Status, Work Order System Status, or Operation User Status data, as this information is sent through the respective status services described further in this document.

The full snapshot record information model is shown in Figure 7-1 below.

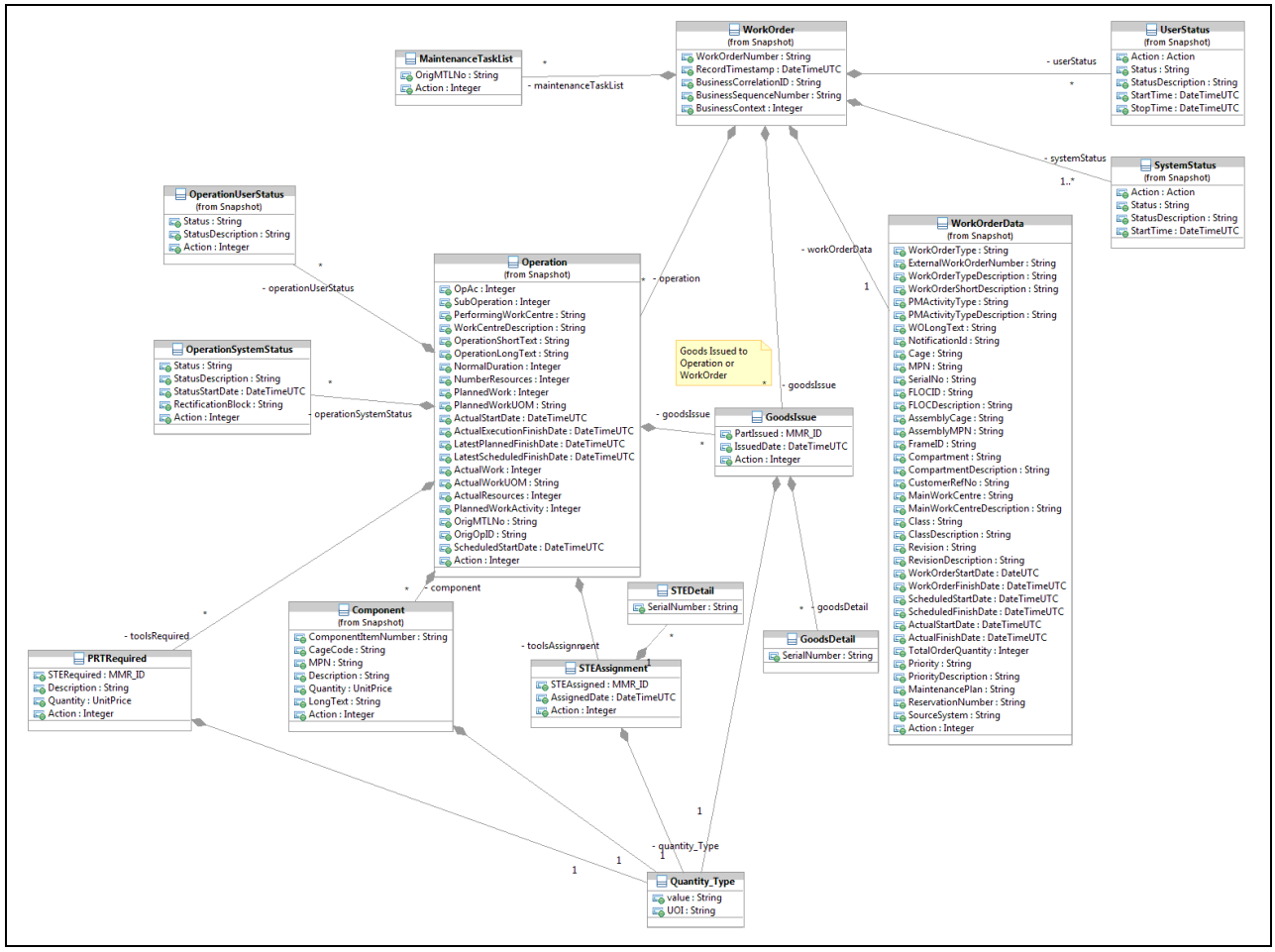


Figure 7-1 Information Model - Work Order for Snapshots

7.2.2 Work Order Acknowledgement

A Work Order Snapshot acknowledgement uses a common Work Order Acknowledgment definition, which is comprised of the following:

- Work Order Identifier (Work Order number, Record Timestamp , Business Correlation ID, Business Sequence Number)
- Status (Success)

[5] Goods Issue data will only be included in the snapshot upon closure of the Work Order.

The Work Order acknowledgement record information model is shown in Figure 7-2 below.

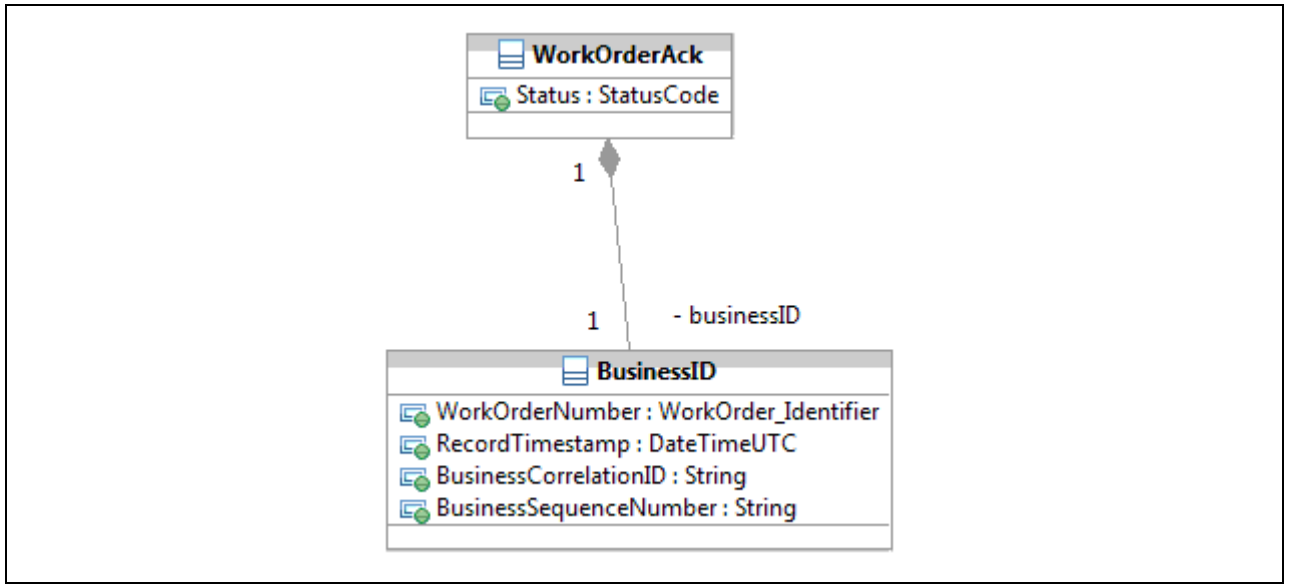


Figure 7-2 Information Model – Work Order Acknowledgement

Note that this Acknowledgement information model is common for all Work Order services.

7.2.3 Work Order Error

A Work Order Snapshot error uses a common Work Order Error definition, which is comprised of the following:

- Business Identifier in this case Work Order Number and Record Timestamp, Business Correlation ID, and Business Sequence Number
- Errors

The Work Order Error record information model is shown in Figure 7-3 below.

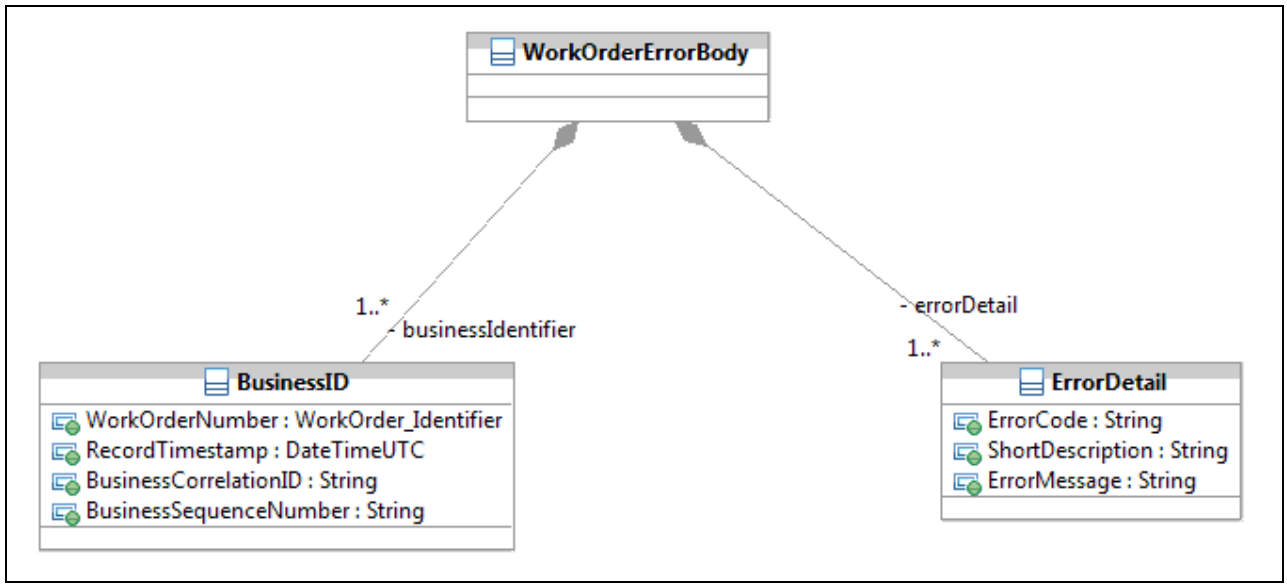


Figure 7-3 Information Model – Work Order Error

Note that this Error information model is common for all Work Order services.

7.3 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.

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

As all Work Order messages use a similar pattern for output and fault message definition, it will be defined once here and referenced elsewhere.

7.3.1 Work Order Snapshot Request

7.3.1.1 Work Order Snapshot Input Body

As shown in Figure 7-4, a Work Order Input body consists of:

- A Message Header;
- A Security Block;
- A set of Work Order Snapshot records.

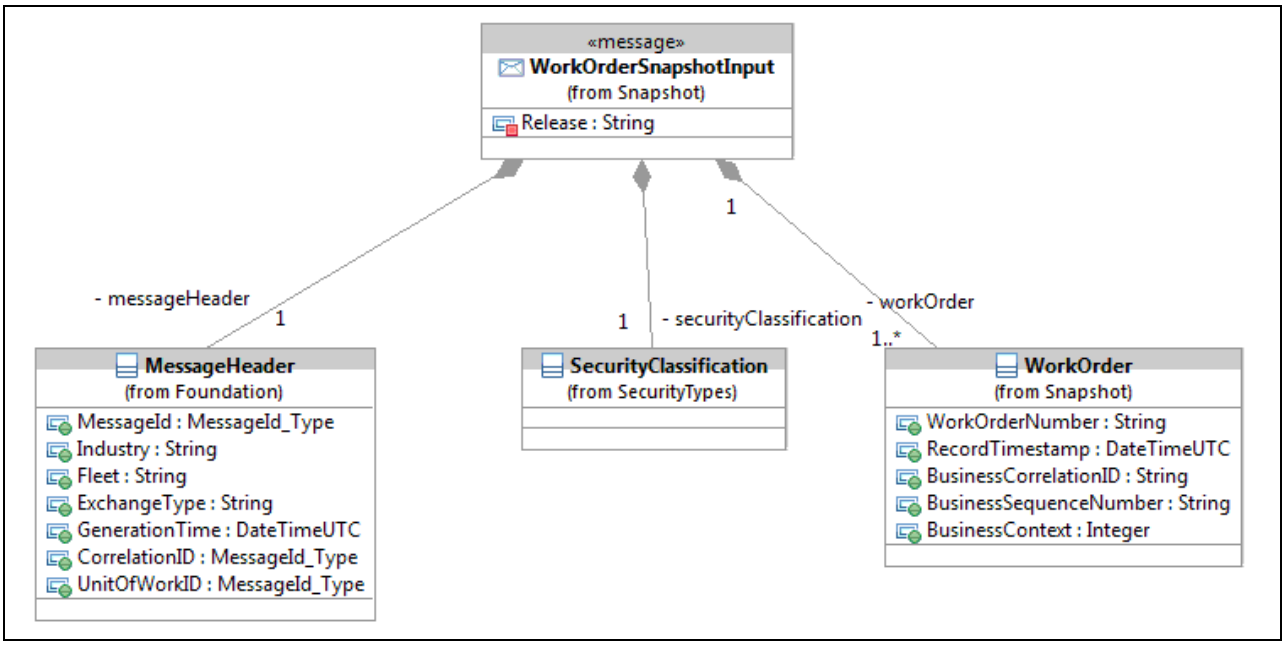


Figure 7-4 Exchange Messages – Work Order Snapshot Request

7.3.1.2 Work Order Output Body

The output of the Work Order Snapshot Request operation is the WorkOrderSnapshotOutputBody.

The Work Order Snapshot Output Body uses a common Work Order Output Body definition (see Figure 7-5), which is comprised of the following:

- A Message Header;
- A WorkOrderOutput indicating acceptance; the Work Order message is accepted in its entirety only.

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

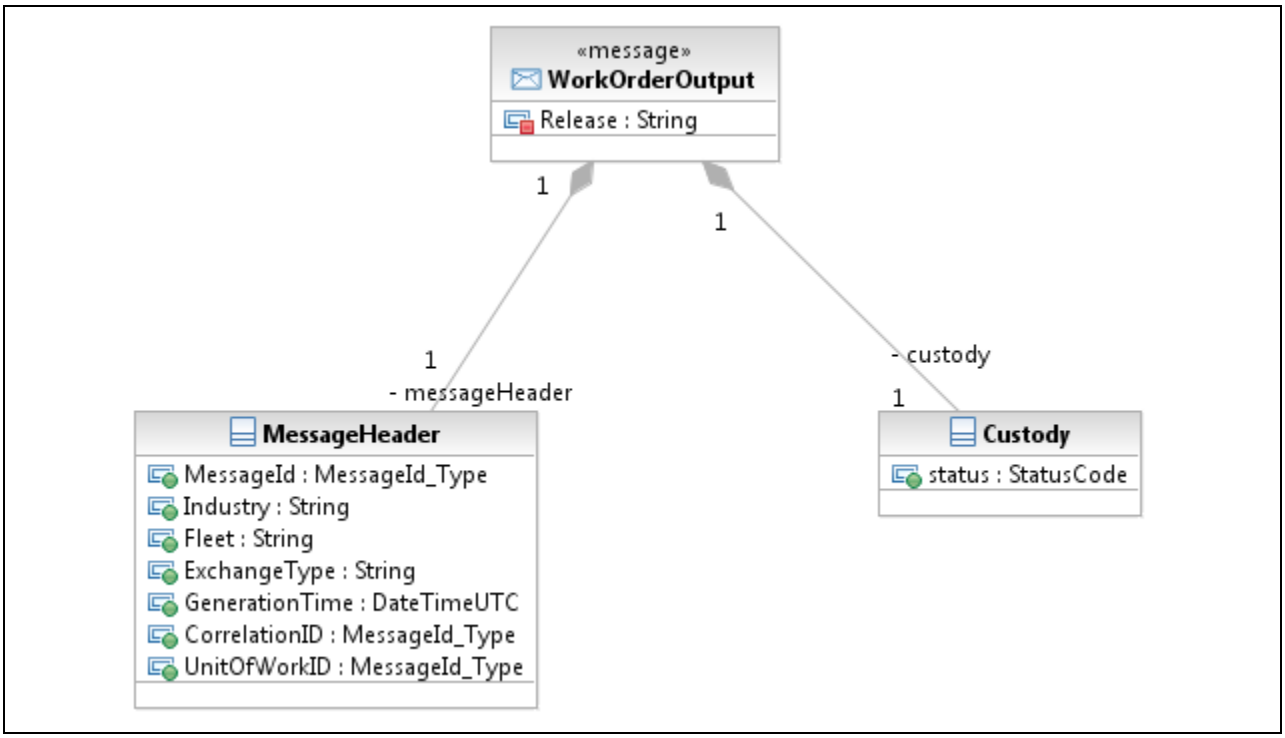


Figure 7-5 Exchange Messages - WorkOrder Output Body

For a Work Order OutputBody:

- The MessageHeader Correlation ID will reflect the Message ID of the originating input message.
- The MessageID is a newly generated UUID
- UnitofWorkID is not used or applicable for this type of message;
- The MessageHeader Exchange Type must be set to the Exchange Type of the Input message;
- The value of the WorkOrderOutput 'Custody' evaluates to "success".

Please note that this is a common Output Body definition is used through all WorkOrder output messages.

7.3.1.3 Work Order Fault Body

A fault returned by the Work Order operation uses the FaultBody element. A Work Order Snapshot Fault Body uses a common Work Order Fault Body definition (see Figure 7-6), which is comprised of the following:

- 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.

Note: Follow implementation direction as per the Service Interaction Model [Ref. 3] for the Fault Message in addition to what has been specified above.

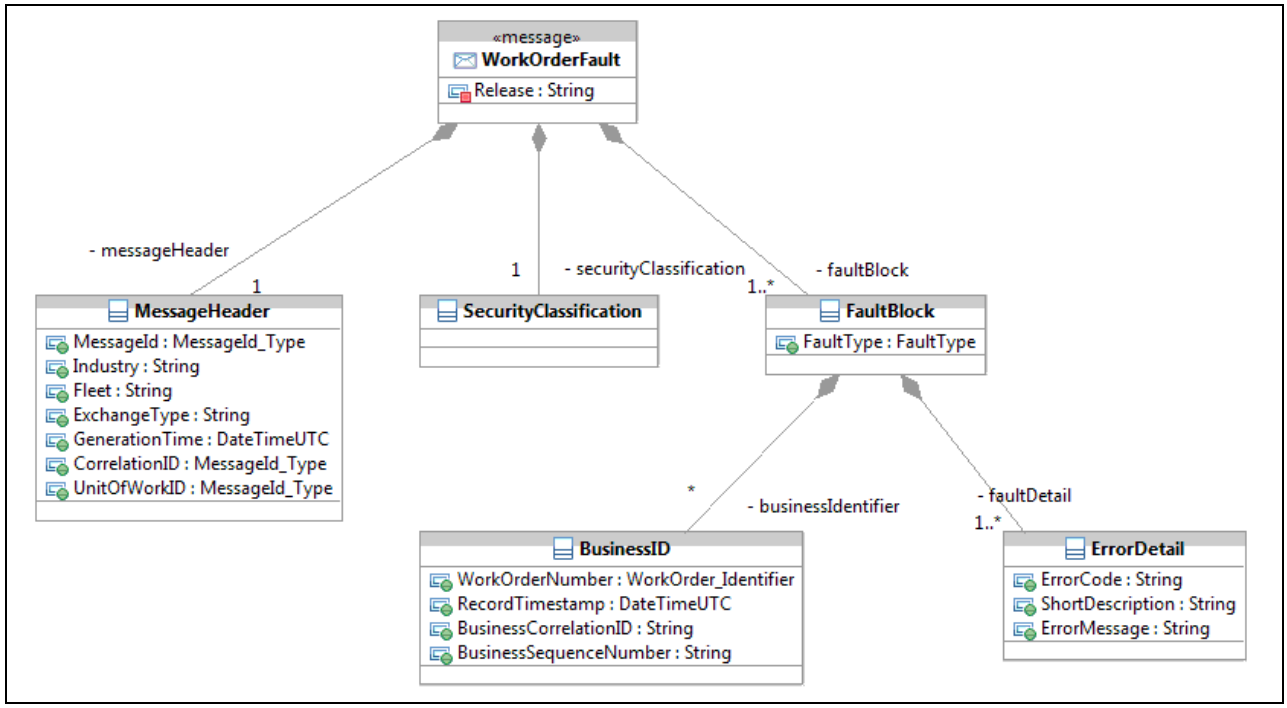


Figure 7-6 Exchange Messages – Work Order Fault Body

For a WorkOrderFaultBody:

- The MessageHeader Correlation ID will reflect the Message ID of the originating Work Order input message;
- The MessageID is a newly generated UUID;
- UnitofWorkID is not used;
- The MessageHeader Exchange Type must be set to the Exchange Type of the Work Order InputBody.

Please note that this is a common Fault Body definition used through all Work Order fault messages.

7.3.2 Work Order Snapshot Acknowledgement Request

7.3.2.1 Work Order Acknowledgement Input Body

A Work Order Snapshot Acknowledgement Input body uses a common Work Order Acknowledgement input Body definition (see Figure 7-7), which consists of:

- A Message header;

- A set of Work Order Acknowledgement blocks which may comprise the following:
  - WorkOrder identifier (WorkOrder Number and Record Timestamp, Business Correlation ID, Business Sequence Number)
  - Status (Success)

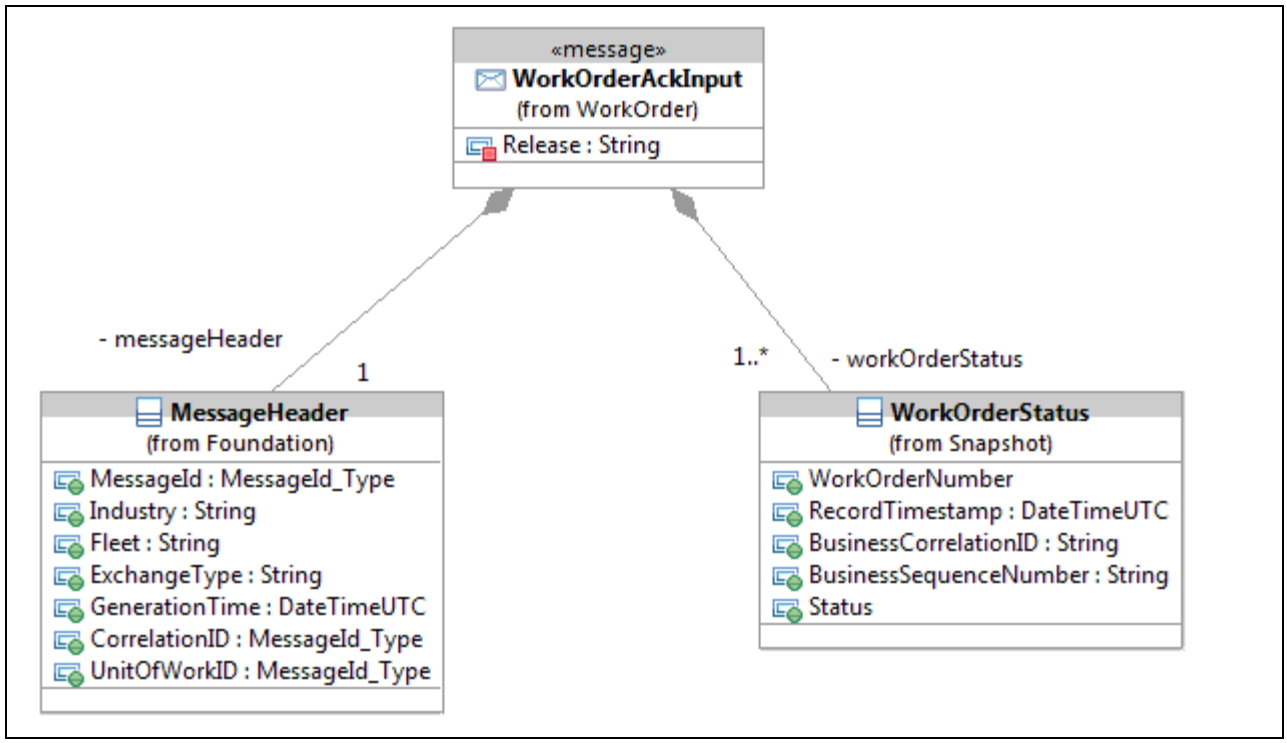


Figure 7-7 Exchange Messages – Work Order Acknowledgement Request

Please note that this is a common Acknowledgement Input Body definition used through all Work Order Acknowledgment Input messages.

7.3.2.2 Work Order Snapshot Acknowledgement Output Body

Please refer to 7.3.1.2 Work Order Output Body for this definition.

7.3.2.3 Work Order Snapshot Acknowledgement Fault Body

Please refer to 7.3.1.3 Work Order Fault Body for this definition.

7.3.3 Work Order Snapshot Error Request

7.3.3.1 Work Order Error Input Body

A Work Order Snapshot Error Input Body uses a common Work Order Error Input Body definition, which comprises the following:

- A Message header;
- A Security Block;

- A set of errors identified by Business ID.

Figure 7-8 presents the Work Order error request diagram.

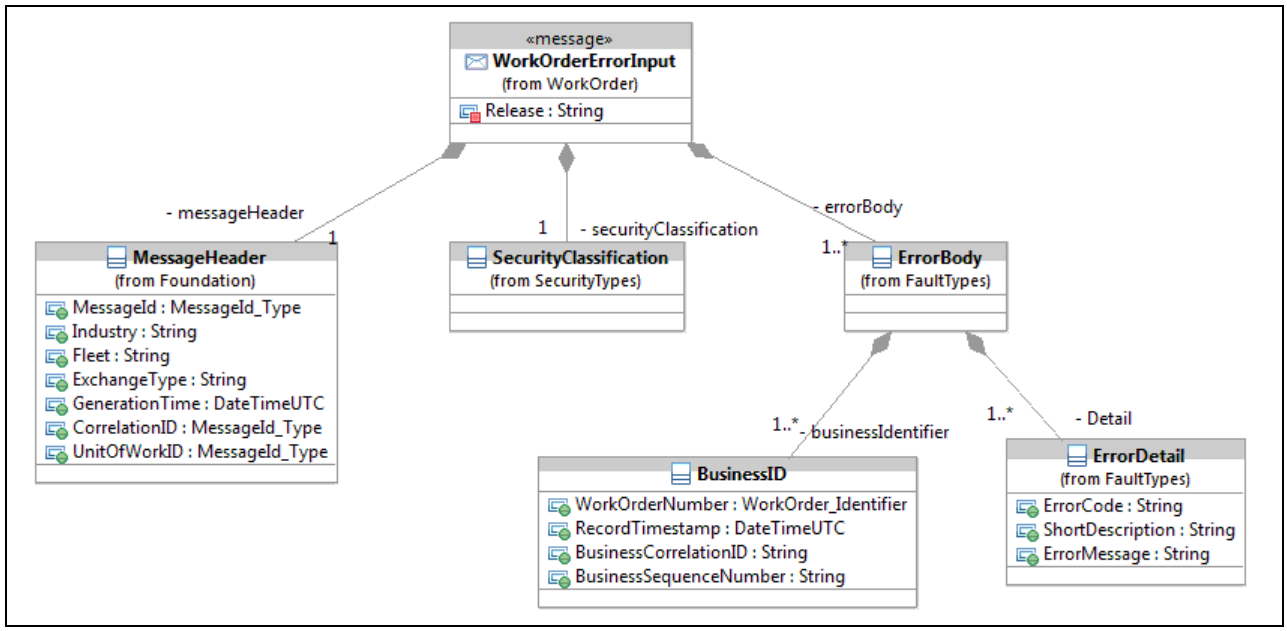


Figure 7-8 Exchange Messages – Work Order Error Request

The error input 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 consumer can provide. To report differing errors on more than one business object extra error blocks can be included in the error input message.

Please note that this is a common Error Input Body definition used through all Work Order Error Input messages.

7.3.3.2 Work Order Snapshot Error Output Body

Please refer to 7.3.1.2 Work Order Output Body for this definition.

7.3.3.3 Work Order Snapshot Error Fault Body

Please refer to 7.3.1.3 Work Order Fault Body for this definition.

7.4 Service Operations

7.4.1 Detailed Operation Characteristics – Send WorkOrderSnapshot

Each operation will have the detailed characteristics described in the following tables.

Details of non-functional requirements may vary depending on Industry and fleet.

Interface Definition	Description
Operation Name	Send Work Order Snapshot
Operation Technical Name	SendWorkOrderSnapshot
Operation Description	This operation is invoked to send one or more Work Order snapshot records to Industry by DND Canada, subject to size and delay constraints for the Fleet and Industry.
Target Operation Provider	Industry
Target Operation Consumer	EDE
Properties	*Request/Response* message exchange pattern.
Input Message Definition	Please refer to operation message model section 7.3.1.1 Work Order Snapshot Input Body for details. Refer to WO_Snapshot_Industry.wsdl for implementation details
Output Message Definition	Please refer to operation message model section 7.3.1.2 Work Order Snapshot Output Body for details. Refer to WO_Snapshot_Industry.wsdl for implementation details
Fault Definition	Please refer to operation message model section 7.3.1.3 Work Order Snapshot Fault Body for details. Refer to WO_Snapshot_Industry.wsdl for implementation details

Non Functional Requirements/Technical Details	
Frequency	Initially once per day.
Peak Throughput Time	Expected to be off-peak, e.g. after ZULU 01:00 and before ZULU 11:00 ZULU
Peak Throughput Volume	Based on Service Level Agreements (SLA) to be determined between Canada and Industry on a per ship class basis.
Payload Size	A WorkOrder Snapshot record ~60Kb. Acknowledgement and error are <1KB per record response.

Attachments	None
Attachment Size	N/A
ACK Time Interval	5 minutes
Retry Time Interval	15 minutes
Biz. Response Time Interval	N/A
Time to Live Span	24 hours
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.

7.4.2 Detailed Operation Characteristics –WorkOrderSnapshotAcknowledgement

Interface Definition	Description
Operation Name	Work Order Snapshot Acknowledgement
Operation Technical Name	WorkOrderSnapshotAcknowledgement
Operation Description	This operation is invoked to send one or more WorkOrder Snapshot acknowledgement records to Canada by Industry.
Target Operation Provider	Canada EDE
Target Operation Consumer	Industry
Properties	*Request/Response* message exchange pattern.
Input Message Definition	Please refer to operation message model section 7.3.2.1 WorkOrder Snapshot Acknowledgement Input Body for details. Refer to WO_Snapshot_Canada.wsdl for implementation details
Output Message Definition	Please refer to operation message model section 7.3.2.2 WorkOrder Snapshot Acknowledgement Output Body for details. Refer to WO_Snapshot_Canada.wsdl for implementation details
Fault Definition	Please refer to operation message model section 7.3.2.3 WorkOrder Snapshot Acknowledgement Fault Body for details. Refer to WO_Snapshot_Canada.wsdl for implementation details

7.4.3 Detailed Operation Characteristics –WorkOrderSnapshotError

Interface Definition	Description
Operation Name	WorkOrder Snapshot Error
Operation Technical Name	WorkOrderSnapshotError
Operation Description	This operation is invoked to send one or more WorkOrderSnapshot error records to Canada by Industry.
Target Operation Provider	Canada EDE
Target Operation Consumer	Industry
Properties	*Request/Response* message exchange pattern.
Input Message Definition	Please refer to operation message model section 7.3.3.1 WorkOrder Snapshot Error Input Body for details. Refer to WO_Snapshot_Canada.wsdl for implementation details
Output Message Definition	Please refer to operation message model section 7.3.3.2 WorkOrder Snapshot Error Output Body for details. Refer to WO_Snapshot_Canada.wsdl for implementation details
Fault Definition	Please refer to operation message model section 7.3.3.3 WorkOrder Snapshot Error Fault Body for details. Refer to WO_Snapshot_Canada.wsdl for implementation details

8 Service Description- Maintenance WorkOrder User Status

A UserStatus consists of a Code value and a Description. A UserStatus is set by an explicit user action in CMMS. When the user first sets a user status for a work order the StartTimestamp field is set. When the user clears the user status the StopTimestamp field is set. As these are distinct user actions, in any work order exchange only one or the other will be set (i.e. the latest to have changed). If the StartTimestamp is set and the StopTimestamp is not set, then the UserStatus is considered **active**.

Note that the User Status as described in this section is a business object relevant to maintenance and is distinct from a status record used in EIE Acknowledgement operations.

8.1 Service Overview

8.1.1 Work Order User Status (Canada to Industry)

This operation is used by Canada EDE to send a Work Order User Status message to Industry. Industry's implementation of this operation will perform authentication, authorization and schema validation on the Work Order User Status 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 message for further processing. If Industry does NOT accept the message, Industry will return one or more fault blocks.

For the User Status service Canada will send user status (one or more) as sub-record(s) of a parent Work Order, the parent record will also include the following:

- Work Order number
- Record timestamp - identifying time at which the business event triggered creation of the Work Order exchange record.
- Business Correlation ID/Business Sequence Number – used to uniquely identify a Work Order business object

Each User Status sub-record within a Work Order parent will include:

- action - indicating whether this is a new record instance, an edit, a delete, or a snapshot action

8.1.2 Acknowledgement (Industry to Canada)

This operation is used by Industry to send a Work Order User Status Acknowledgement message to Canada EDE. Canada's implementation of this operation will perform authentication, authorization and schema validation on the Work Order Snapshot Acknowledgement message. Canada will return a status or fault information to the consumer.

If Canada accepts the message for further processing an output message is returned. If 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.

The Work Order User Status acknowledgement allows Industry to report back a positive acknowledgment upon consuming the incoming Work Order User Status message.

For a positive (successful) acknowledgement, Industry returns the following:

- Message Header
- Work Order Identifier (including Record Timestamp, Business Correlation ID, Business Sequence Number)

8.1.3 Error (Industry to Canada)

This operation is used by Industry to send a Work Order User Status Error message to Canada EDE. Canada's implementation of this operation will perform authentication, authorization and schema validation on the Work Order User Status Error message. Canada will return a status or fault information to the consumer.

If Canada accepts the message for further processing an output message is returned. If 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.

The Work Order User Status error allows Industry to report back business errors encountered while processing the business objects contained within the Work Order User Status payload. Industry returns the following:

- Message Header
- Business Identifier
- Errors encountered in processing.

For Work Order User Status service, Business Identifier is comprised of the combination of the following attributes:

- Work Order Identifier +
- Record Timestamp, Business Correlation ID, Business Sequence Number

8.1.4 Service Properties

Service Property	Description
Enterprise Service Name (Business)	Maintenance Work Order User Status Service
Enterprise Service Name (Technical)	MaintenanceWorkOrderUserStatusService
Purpose	This service supports the Canada DND Maintenance process. This service sends work order data to Industry on a pre-negotiated schedule.
Service Domain	Maintain Platform
Business Owner	ADM (IM)
Service Grouping	Maintain Platform – Corrective and Preventive maintenance
Source Provider	WorkOrderUserStatus – Industry WorkOrderUserStatus Acknowledgement - Canada DND WorkOrderUserStatus Error - Canada DND

Service Property	Description
Target Service Consumers	WorkOrderUserStatus – Canada DND WorkOrderUserStatus Acknowledgement – Industry WorkOrderUserStatus Error - Industry
Business Process Supported (now)	Functional Area: Preventive and Corrective Maintenance • Cancel
Business Process Supported (future)	None currently identified.
Business Objective Supported	In order for Industry to perform under the constraints of the PBC contract, work order history on maintenance of the supplied inventory is sent to Industry. Industry uses this information to plan their inventories based on upcoming work (R&M evaluation), and analyze aircraft and maintenance performance for the Weapon System. (PBA evaluation).
Expected life time	Full life-time of weapon systems using PBC.

8.2 Information Model

Within the scope of this service a WorkOrder exchange record contains all instances of UserStatus records changed since the last user status capture.

8.2.1 WorkOrder User Status

The WorkOrder User Status record information model is shown Figure 8-1 below.

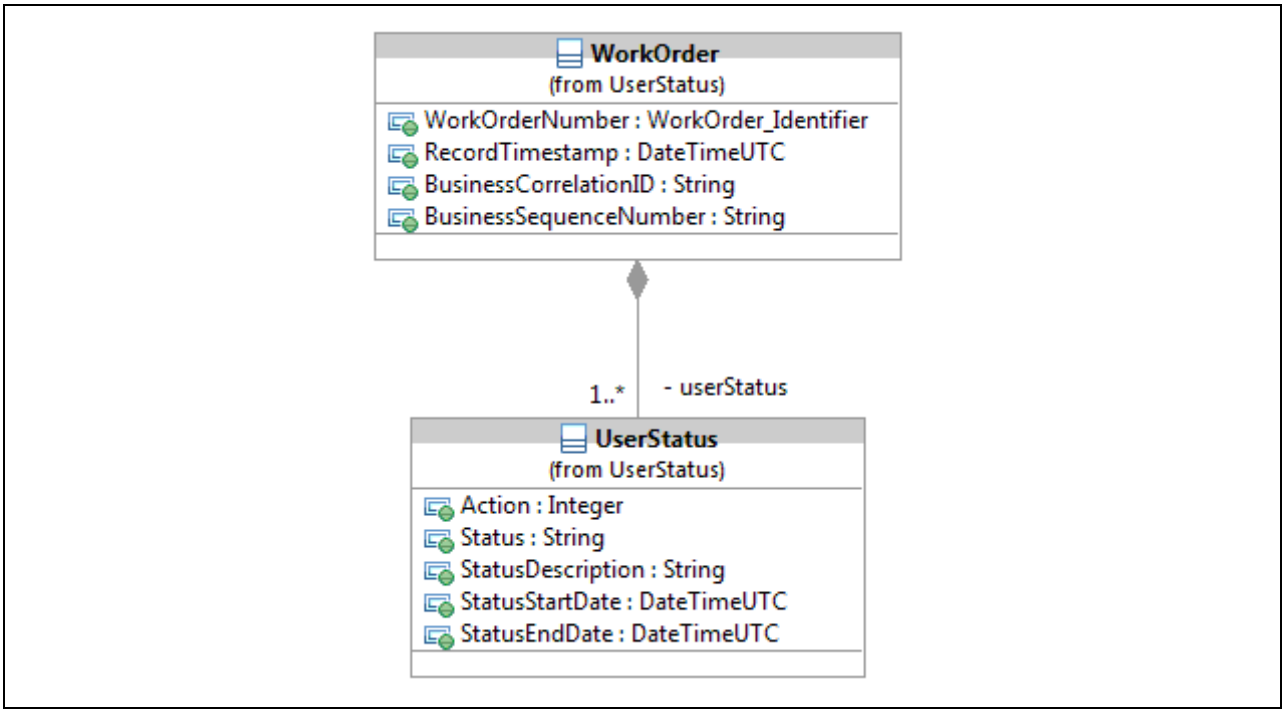


Figure 8-1 Information Model – WorkOrder User Status

8.2.2 WorkOrder User Status Acknowledgement

A WorkOrder User Status acknowledgement may be comprised of the following:

- WorkOrder identifier (WorkOrder number and record timestamp, Business Correlation ID, Business Sequence Number)
- Status (Success).

The WorkOrder User Status acknowledgement record information model is the same as presented in 7.2.2 WorkOrder Acknowledgement.

8.2.3 WorkOrder User Status Error

A WorkOrder User Status error may be comprised of the following:

- Business Identifier, in this case WorkOrder number and Record Timestamp, Business Correlation ID, Business Sequence Number
- Errors.

The WorkOrder User Status acknowledgement record information model is the same as presented in 7.2.3 WorkOrder Error.

8.3 Operation Message Model

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

8.3.1 WorkOrder User Status Request

8.3.1.1 WorkOrder User Status Input Body

Within the scope of this service there is an input request named 'WorkOrderRequest' (see Figure 8-2), consisting of:

- Message Header
- Security Block
- A list of WorkOrders – each WorkOrder constrained to contain one or more UserStatus records.

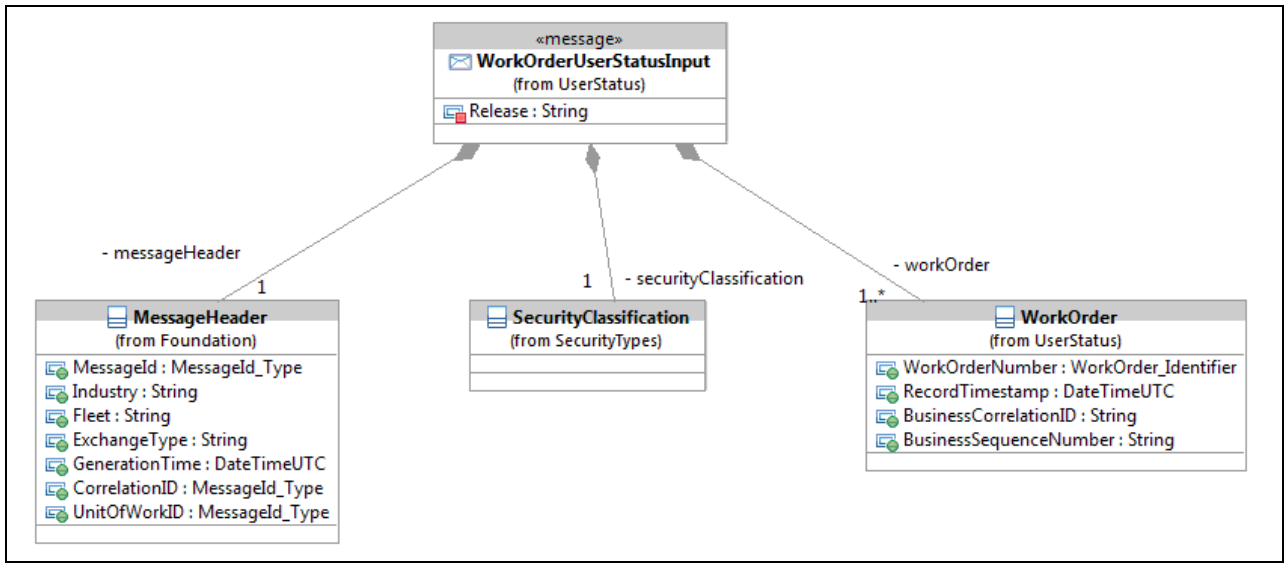


Figure 8-2 Exchange Messages - WorkOrder User Status Request

8.3.1.2 WorkOrder User Status Output Body

Please refer to 7.3.1.2 WorkOrder Output Body for the common definition of Output Body.

8.3.1.3 WorkOrder User Status Fault Body

Please refer to 7.3.1.3 WorkOrder Fault Body for the common definition of Fault Body.

8.3.2 WorkOrder User Status Acknowledgement Request

8.3.2.1 WorkOrder User Status Acknowledgement Input Body

Please refer to 7.3.2.1 WorkOrder Acknowledgement Input Body for the common definition of Acknowledgement Body.

8.3.2.2 WorkOrder User Status Acknowledgement Output Body

Please refer to 7.3.1.2 WorkOrder Output Body for the common definition of Output body.

8.3.2.3 WorkOrder User Status Acknowledgement Fault Body

Please refer to 7.3.1.3 WorkOrder Fault Body for the common definition of Fault body.

8.3.3 WorkOrder User Status Error Request

8.3.3.1 WorkOrder User Status Error Input Body

Please refer to 7.3.3.1 WorkOrder Error Input Body for the common definition of Error Input Body.

8.3.3.2 WorkOrder User Status Error Output Body

Please refer to 7.3.1.2 WorkOrder Output Body for the common definition of Output body.

8.3.3.3 WorkOrder User Status Error Fault Body

Please refer to 7.3.1.3 WorkOrder Fault Body for the common definition of Fault body.

8.4 Service Operations

8.4.1 Detailed Operation Characteristics – SendWorkOrderUserStatus

Each operation will have the detailed characteristics described in the following tables.

Details of non-functional requirements may vary depending on Industry and fleet.

Interface Definition	Description
Operation Name	Send WorkOrder User Status
Operation Technical Name	SendWorkOrderUserStatus
Operation Description	This operation is invoked to send one or more WorkOrder User Status records to Industry by DND Canada, subject to size and delay constraints for the Fleet and Industry.
Target Operation Provider	Industry
Target Operation Consumer	EDE
Properties	*Request/Response* message exchange pattern.
Input Message Definition	Please refer to operation message model section 8.3.1.1 WorkOrder User Status Input Body for details. Refer to WO_UserStatus_Industry.wsdl for implementation details
Output Message Definition	Please refer to operation message model section 8.3.1.2 WorkOrder User Status Output Body for details. Refer to WO_UserStatus_Industry.wsdl for implementation details
Fault Definition	Please refer to operation message model section 8.3.1.3 WorkOrder User Status Fault Body for details. Refer to WO_UserStatus_Industry.wsdl for implementation details

Non Functional Requirements/Technical Details	
Frequency	Initially once per day.
Peak Throughput Time	Expected to be off-peak, e.g. after ZULU 01:00 and before ZULU 11:00 ZULU
Peak Throughput Volume	Based on Service Level Agreements (SLA) to be determined between Canada and Industry on a per ship class basis.
Payload Size	A request may contain many WorkOrder parent records, each of which may contain many User Status records. A WorkOrder User Status record is <1KB.
Attachments	None
Attachment Size	N/A
ACK Time Interval	5 minutes
Retry Time Interval	15 minutes
Biz. Response Time Interval	N/A
Time to Live Span	24 hours
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.

8.4.2 Detailed Operation Characteristics – WorkOrderUserStatusAcknowledgement

Interface Definition	Description
Operation Name	WorkOrder User Status Acknowledgement
Operation Technical Name	WorkOrderUserStatusAcknowledgement
Operation Description	This operation is invoked to send one or more WorkOrder User Status acknowledgement records to Canada by Industry. One input message may contain acknowledgements for many WorkOrder User Status records.
Target Operation Provider	Canada EDE

Interface Definition	Description
Target Operation Consumer	Industry
Properties	*Request/Response* message exchange pattern.
Input Message Definition	Please refer to operation message model section 8.3.2.1 WorkOrder User Status Acknowledgement Input Body for details. Refer to WO_UserStatus_Canada.wsdl for implementation details
Output Message Definition	Please refer to operation message model section 8.3.2.2 WorkOrder User Status Acknowledgement Output Body for details. Refer to WO_UserStatus_Canada.wsdl for implementation details
Fault Definition	Please refer to operation message model section 8.3.2.3 WorkOrder User Status Acknowledgement Fault Body for details. Refer to WO_UserStatus_Canada.wsdl for implementation details

For Non-Functional Requirements see Section 8.4.1.

8.4.3 Detailed Operation Characteristics –WorkOrderUser StatusError

Interface Definition	Description
Operation Name	WorkOrderUserStatusError
Operation Technical Name	WorkOrderUserStatusError
Operation Description	This operation is invoked to send one or more WorkOrderUserStatus error records to Canada by Industry.
Target Operation Provider	Canada EDE
Target Operation Consumer	Industry
Properties	*Request/Response* message exchange pattern.
Input Message Definition	Please refer to operation message model section 8.3.3.1 WorkOrder User Status Error Input Body for details. Refer to WO_UserStatus_Canada.wsdl for implementation details
Output Message Definition	Please refer to operation message model section 8.3.3.2 WorkOrder User Status Error Output Body for details. Refer to WO_UserStatus_Canada.wsdl for implementation details
Fault Definition	Please refer to operation message model section 8.3.3.3 WorkOrder User Status Error Fault Body for details. Refer to WO_UserStatus_Canada.wsdl for implementation details

For Non-Functional Requirements see Section 8.4.1.

9 Service Description- Maintenance WorkOrder System Status

For the purpose of maintenance exchange, SystemStatus records are defined and handled similarly to UserStatus. The distinction between UserStatus and SystemStatus has significance to the business systems on either end of the exchange. With a Work Order System Status record, the SystemStatus records sent to Industry represent distinct consecutive life-cycle states of a WorkOrder. In this case a SystemStatus is active when it is received and remains active until it is replaced by a later SystemStatus record with its StartTimestamp set. There shall be only one active SystemStatus at a time and the StopTimestamp of a SystemStatus is implicitly the StartTimestamp of its successor.

9.1 Service Overview

9.1.1 WorkOrder System Status (Canada to Industry)

This operation is used by Canada EDE to send a WorkOrder System Status message to Industry. Industry's implementation of this operation will perform authentication, authorization and schema validation on the WorkOrder System Status 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 message for further processing. If Industry does NOT accept the message, Industry will return one or more fault blocks.

For the System Status service Canada will send System status (one or more) as sub-record(s) of a parent WorkOrder, the parent record will also include the following:

- WorkOrder number
- Record timestamp - identifying time at which the business event triggered creation of the WorkOrder exchange record.
- Business Correlation ID/Business Sequence Number – used to uniquely identify a Work Order business object

Each System Status sub-record within a WorkOrder parent will include:

- Action - indicating whether this is a new record instance, an edit, a delete, or a snapshot action.

9.1.2 Acknowledgement (Industry to Canada)

This operation is used by Industry to send a WorkOrder System Status Acknowledgement message to Canada EDE. Canada's implementation of this operation will perform authentication, authorization and schema validation on the WorkOrder System Status Acknowledgement message. Canada will return a status or fault information to the consumer.

If Canada accepts the message for further processing an output message is returned. If 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.

The WorkOrder System Status acknowledgement allows Industry to report back a positive acknowledgment upon consuming the incoming WorkOrder System Status message.

For a positive (successful) acknowledgement, Industry returns the following:

- Message Header
- WorkOrder Identifier (including Record Timestamp, Business Correlation ID, Business Sequence Number)

9.1.3 Error (Industry to Canada)

This operation is used by Industry to send a WorkOrder System Status Error message to Canada EDE. Canada's implementation of this operation will perform authentication, authorization and schema validation on the WorkOrder System Status Error message. Canada will return a status or fault information to the consumer.

If Canada accepts the message for further processing an output message is returned. If 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.

The WorkOrder System Status error allows Industry to report back business errors encountered while processing the business objects contained within the WorkOrder System Status payload. Industry returns the following:

- Message Header
- Business Identifier
- Errors encountered in processing.

For Work Order Operation Status service, Business Identifier is comprised of the combination of the following attributes:

- Work Order Identifier +
- Record Timestamp, Business Correlation ID, Business Sequence Number

9.1.4 Service Properties

Service Property	Description
Enterprise Service Name (Business)	Maintenance WorkOrder SystemStatus Service
Enterprise Service Name (Technical)	MaintenanceWorkOrderSystemStatusService
Purpose	This service supports the Canada DND Maintenance process. This service sends WorkOrder data to Industry on a pre-negotiated schedule.
Service Domain	Maintain Platform
Business Owner	ADM (IM)
Service Grouping	Maintain Platform – Corrective and Preventive maintenance

Service Property	Description
Source Provider	WorkOrderSystemStatus – Industry WorkOrderSystemStatus Acknowledgement - Canada DND WorkOrderSystemStatus Error - Canada DND
Target Service Consumers	WorkOrderSystemStatus – Canada DND WorkOrderSystemStatus Acknowledgement – Industry WorkOrderSystemStatus Error – Industry
Business Process Supported (now)	Functional Area: Preventive and Corrective Maintenance • Preventive Maintenance (PM) Planning – PM Initialization – Maintenance Planning - Fleet Maintenance Facility (FMF) • Corrective Maintenance Planning • Execute Corrective or Preventive Maintenance ○ Execute Maintenance - Ship Staff/FMF ○ Execute Maintenance - ISS Contractor • Cancel Functional Area: Configuration Control • Engineering Change Options Analysis • Engineering Change Package Development • Fleet Maintenance Facility (FMF) Taskings •
Business Process Supported (future)	None currently identified.
Business Objective Supported	In order for Industry to perform under the constraints of the PBC contract, WorkOrder history on maintenance of the supplied inventory is sent to the industry. Industry uses this information to plan their inventories based on upcoming work and analyze performance of the maintenance tasks.
Expected life time	Full life-time of weapon systems using PBC.

9.2 Information Model

Within the scope of this service a WorkOrder exchange record contains all instances of SystemStatus records changed since the last System status capture.

9.2.1 WorkOrder System Status

The WorkOrder System Status record information model is shown Figure 9-1 below.

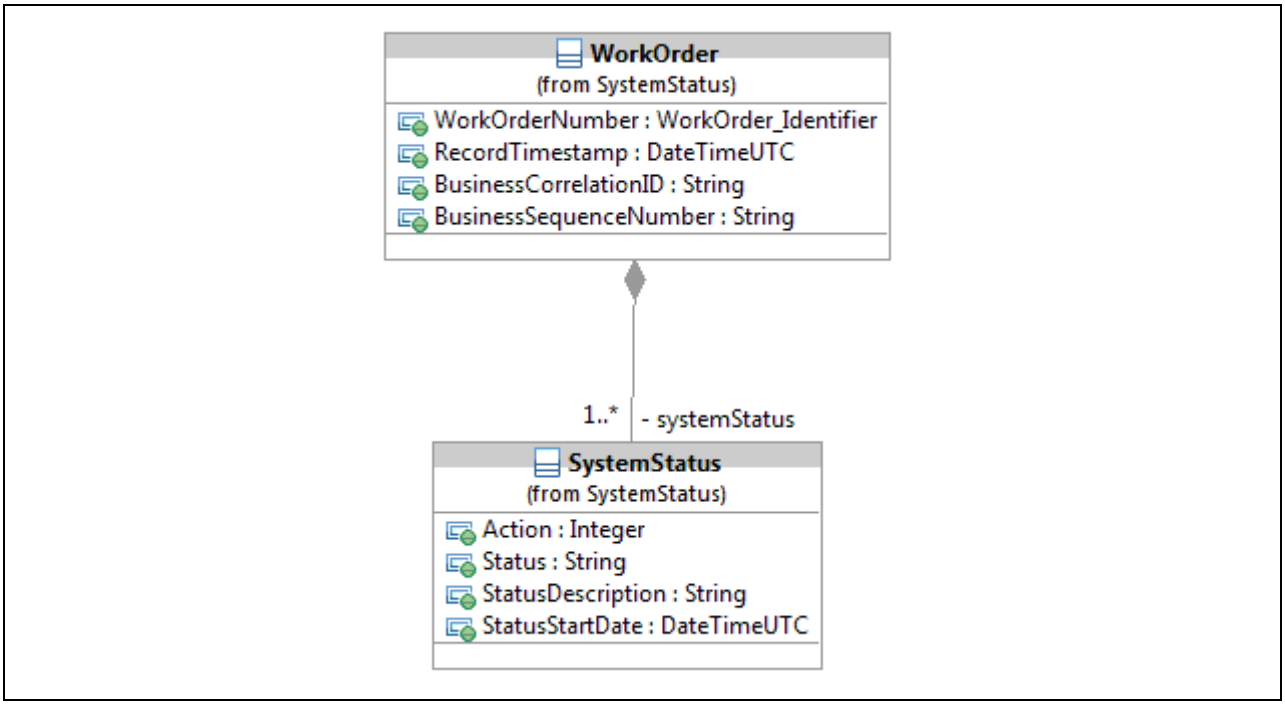


Figure 9-1 Information Model – WorkOrder System Status

9.2.2 WorkOrder System Status Acknowledgement

A WorkOrder System Status acknowledgement may be comprised of the following:

- WorkOrder Identifier (WorkOrder Number and Record Timestamp, Business Correlation ID, Business Sequence Number)
- Status (Success)

The WorkOrder System Status acknowledgement record information model is the same as presented in 7.2.2 WorkOrder Acknowledgement.

9.2.3 WorkOrder System Status Error

A WorkOrder System Status error may be comprised of the following:

- Business Identifier, in this case WorkOrder Number and Record Timestamp, Business Correlation ID, Business Sequence Number
- Errors

The WorkOrder System Status acknowledgement record information model is the same as presented in 7.2.3 WorkOrder Error.

9.3 Operation Message Model

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

9.3.1 WorkOrder System Status Request

9.3.1.1 WorkOrder System Status Input Body

Within the scope of this service there is an input request named 'WorkOrderRequest' (see Figure 9-2), consisting of:

- Message Header
- Security Block
- A list of WorkOrders – each WorkOrder constrained to contain one or more SystemStatus records.

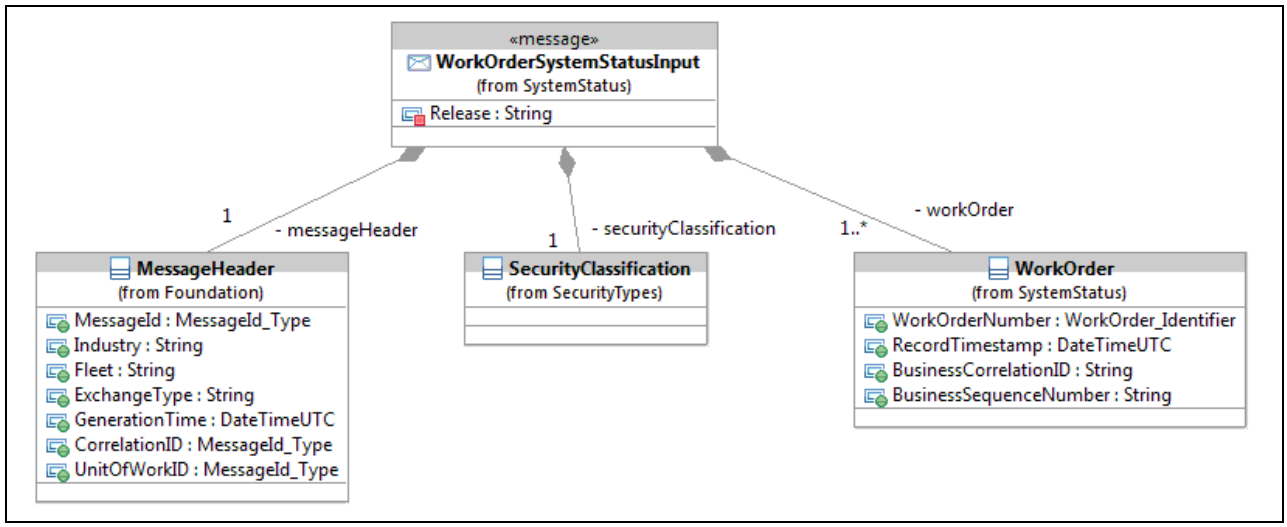


Figure 9-2 Exchange Messages - WorkOrder System Status Request

9.3.1.2 WorkOrder System Status Output Body

Please refer to 7.3.1.2 WorkOrder Output Body for the common definition of Output Body.

9.3.1.3 WorkOrder System Status Fault Body

Please refer to 7.3.1.3 WorkOrder Fault Body for the common definition of Fault Body.

9.3.2 WorkOrder System Status Acknowledgement Request

9.3.2.1 WorkOrder System Status Acknowledgement Input Body

Please refer to 7.3.2.1 WorkOrder Acknowledgement Input Body for the common definition of Acknowledgement Body.

9.3.2.2 WorkOrder System Status Acknowledgement Output Body

Please refer to 7.3.1.2 WorkOrder Output Body for the common definition of Output Body.

9.3.2.3 WorkOrder System Status Acknowledgement Fault Body

Please refer to 7.3.1.3 WorkOrder Fault Body for the common definition of Fault Body.

9.3.3 WorkOrder System Status Error Request

9.3.3.1 WorkOrder System Status Error Input Body

Please refer to 7.3.3.1 WorkOrder Error Input Body for the common definition of Error Input Body.

9.3.3.2 WorkOrder System Status Error Output Body

Please refer to 7.3.1.2 WorkOrder Output Body for the common definition of Output Body.

9.3.3.3 WorkOrder System Status Error Fault Body

Please refer to 7.3.1.3 WorkOrder Fault Body for the common definition of Fault Body.

9.4 Service Operations

9.4.1 Detailed Operation Characteristics – SendWorkOrderSystemStatus

Interface Definition	Description
Operation Name	Send WorkOrder System Status
Operation Technical Name	SendWorkOrderSystemStatus
Operation Description	This operation is invoked to send one or more Work Order System Status records to Industry by DND Canada, subject to size and delay constraints for the Fleet and Industry.
Target Operation Provider	Industry
Target Operation Consumer	EDE
Properties	*Request/Response* message exchange pattern.
Input Message Definition	Please refer to operation message model section 9.3.1.1 WorkOrder System Status Input Body for details. Refer to WO_SystemStatus_Industry.wsdl for implementation details
Output Message Definition	Please refer to operation message model section 9.3.1.2 WorkOrder System Status Output Body for details. Refer to WO_SystemStatus_Industry.wsdl for implementation details
Fault Definition	Please refer to operation message model section 9.3.1.3 WorkOrder System Status Fault Body for details. Refer to WO_SystemStatus_Industry.wsdl for implementation details

Non Functional Requirements/Technical Details	
Frequency	Initially once per day.
Peak Throughput Time	Expected to be off-peak, e.g. after ZULU 01:00 and before ZULU 11:00 ZULU

Peak Throughput Volume	Based on Service Level Agreements (SLA) to be determined between Canada and Industry on a per ship class basis.
Payload Size	A request may contain many WorkOrder parent records, each of which may contain many System Status records. A WorkOrder System Status record is <1KB.
Attachments	None
Attachment Size	N/A
ACK Time Interval	5 minutes
Retry Time Interval	15 minutes
Biz. Response Time Interval	N/A
Time to Live Span	24 hours
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.

9.4.2 Detailed Operation Characteristics - WorkOrderSystemStatusAcknowledgement

Interface Definition	Description
Operation Name	WorkOrder System Status Acknowledgement
Operation Technical Name	WorkOrderSystemStatusAcknowledgement
Operation Description	This operation is invoked to send one or more WorkOrder System Status acknowledgement records to Canada by Industry. One input message may contain acknowledgements for many WorkOrder System Status records.
Target Operation Provider	Canada EDE
Target Operation Consumer	Industry
Properties	*Request/Response* message exchange pattern.
Input Message Definition	Please refer to operation message model section 9.3.2.1 WorkOrder System Status Acknowledgement Input Body for details. Refer to WO_SystemStatus_Canada.wsdl for implementation details

Interface Definition	Description
Output Message Definition	Please refer to operation message model section 9.3.2.2 WorkOrder System Status Acknowledgement Output Body for details. Refer to WO_SystemStatus_Canada.wsdl for implementation details
Fault Definition	Please refer to operation message model section 9.3.2.3 WorkOrder System Status Acknowledgement Fault Body for details. Refer to WO_SystemStatus_Canada.wsdl for implementation details

For Non-Functional Requirements see Section 9.4.1.

9.4.3 Detailed Operation Characteristics –WorkOrderSystem StatusError

Interface Definition	Description
Operation Name	WorkOrderSystemStatusError
Operation Technical Name	WorkOrderSystemStatusError
Operation Description	This operation is invoked to send one or more WorkOrderSystemStatus error records to Canada by Industry.
Target Operation Provider	Canada EDE
Target Operation Consumer	Industry
Properties	*Request/Response* message exchange pattern.
Input Message Definition	Please refer to operation message model section 9.3.3.1 WorkOrder System Status Error Input Body for details. Refer to WO_SystemStatus_Canada.wsdl for implementation details
Output Message Definition	Please refer to operation message model section 9.3.3.2 WorkOrder System Status Error Output Body for details. Refer to WO_SystemStatus_Canada.wsdl for implementation details
Fault Definition	Please refer to operation message model section 9.3.3.3 WorkOrder System Status Error Fault Body for details. Refer to WO_SystemStatus_Canada.wsdl for implementation details

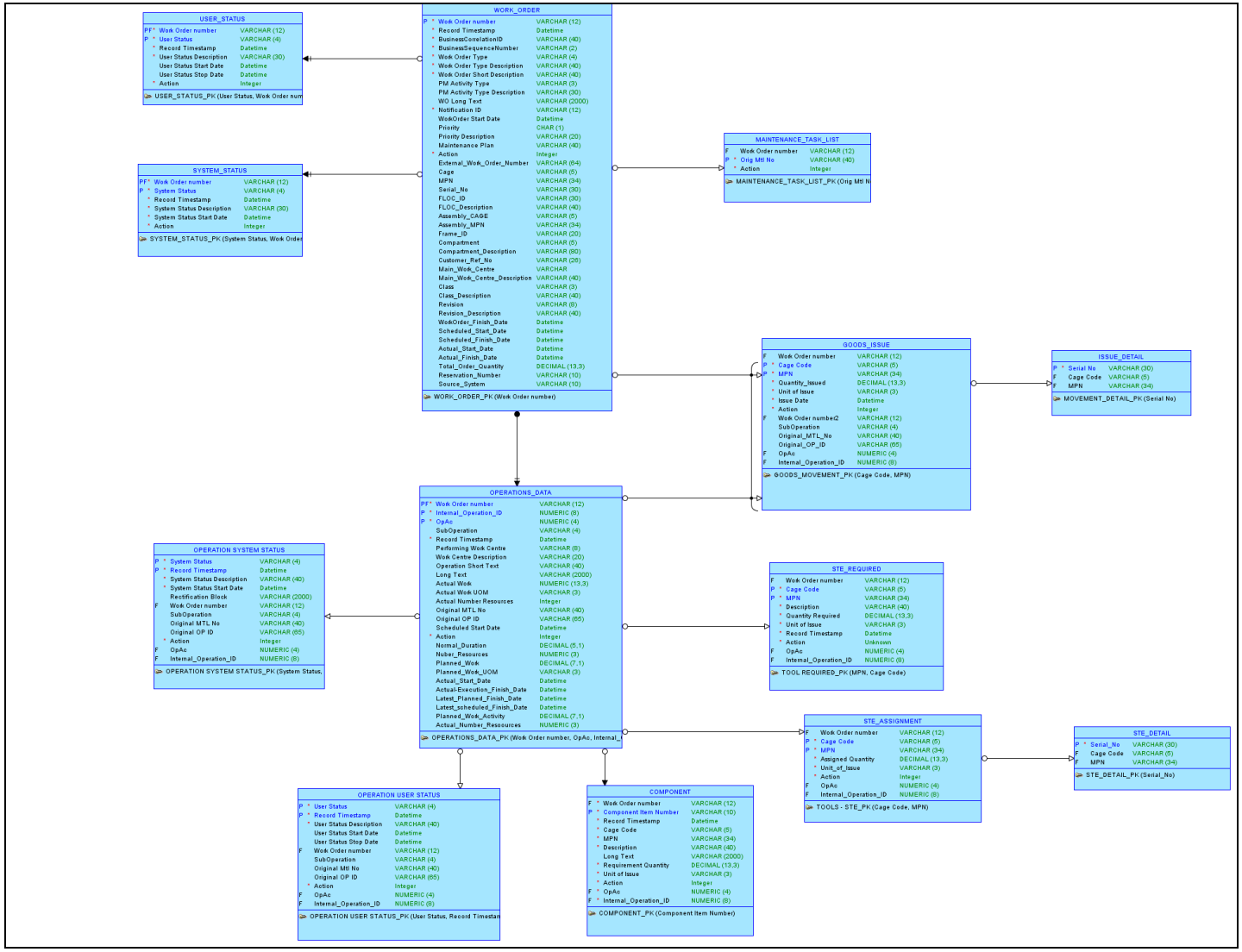
For Non-Functional Requirements see Section 9.4.1.

10 Definitions, Acronyms, Abbreviations

Term	Description
CAGE	Commercial And Government Entity
CMMS	Canada Maintenance Management System
CSS	Canada Supply System
EIE	Electronic Information Environment
EMR	Equipment Master Record
DRMIS	Defense Resource Management Information System
FLOC	Functional Location
FMEA	Failure Mode and Effects Analysis
Industry	The industry contracted to provide support to Canada DND according to PBC
ISSCF	In Service Support Contracting Framework
MER	Master Equipment Record
MPN	Manufacturer Part Number
WO	Work Order
WS	Weapon System

11 Appendix A - Entity Relationship Model

Information Model – Entity-Relationship View


USER_STATUS
Work Order number VARCHAR (12)
User Status VARCHAR (4)
Record Timestamp Datetime
User Status Description VARCHAR (30)
User Status Start Date Datetime
User Status Stop Date Datetime
Action Integer
USER_STATUS_PK (User Status, Work Order num
WORK_ORDER
Work Order number VARCHAR (12)
Record Timestamp Datetime
BusinessCorrelationID VARCHAR (40)
BusinessSequenceNumber VARCHAR (2)
Work Order Type VARCHAR (4)
Work Order Type Description VARCHAR (40)
Work Order Short Description VARCHAR (40)
PM Activity Type VARCHAR (3)
PM Activity Type Description VARCHAR (30)
WO Long Text VARCHAR (2000)
Notification ID VARCHAR (12)
WorkOrder Start Date Datetime
Priority CHAR (1)
Priority Description VARCHAR (20)
Maintenance Plan VARCHAR (40)
Action Integer
External_Work_Order_Number VARCHAR (64)
Cage VARCHAR (5)
MPN VARCHAR (34)
Serial_No VARCHAR (30)
FLOC_ID VARCHAR (30)
FLOC_Description VARCHAR (40)
Assembly_CAGE VARCHAR (5)
Assembly_MPN VARCHAR (34)
Frame_ID VARCHAR (20)
Compartment VARCHAR (5)
Compartment_Description VARCHAR (80)
Customer_Ref_No VARCHAR (28)
Main_Work_Centre VARCHAR
Main_Work_Centre_Description VARCHAR (40)
Class VARCHAR (3)
Class_Description VARCHAR (40)
Revision VARCHAR (8)
Revision_Description VARCHAR (40)
WorkOrder_Finish_Date Datetime
Scheduled_Start_Date Datetime
Scheduled_Finish_Date Datetime
Actual_Start_Date Datetime
Actual_Finish_Date Datetime
Total_Order_Quantity DECIMAL (13,3)
Reservation_Number VARCHAR (10)
Source_System VARCHAR (10)
WORK_ORDER_PK (Work Order number)
MAINTENANCE_TASK_LIST
Work Order number VARCHAR (12)
Orig Mtl No VARCHAR (40)
Action Integer
MAINTENANCE_TASK_LIST_PK (Orig Mtl N
SYSTEM_STATUS
Work Order number VARCHAR (12)
System Status VARCHAR (4)
Record Timestamp Datetime
System Status Description VARCHAR (30)
System Status Start Date Datetime
Action Integer
SYSTEM_STATUS_PK (System Status, Work Order
GOODS_ISSUE
Work Order number VARCHAR (12)
Cage Code VARCHAR (5)
MPN VARCHAR (34)
Quantity_Issued DECIMAL (13,3)
Unit of Issue VARCHAR (3)
Issue Date Datetime
Action Integer
Work Order number2 VARCHAR (12)
SubOperation VARCHAR (4)
Original_MTL_No VARCHAR (40)
Original_OP_ID VARCHAR (65)
OpAc NUMERIC (4)
Internal_Operation_ID NUMERIC (8)
GOODS_MOVEMENT_PK (Cage Code, MPN)
ISSUE_DETAIL
Serial No VARCHAR (30)
Cage Code VARCHAR (5)
MPN VARCHAR (34)
MOVEMENT_DETAIL_PK (Serial No)
OPERATIONS_DATA
Work Order number VARCHAR (12)
Internal_Operation_ID NUMERIC (8)
OpAc NUMERIC (4)
SubOperation VARCHAR (4)
Record Timestamp Datetime
Performing Work Centre VARCHAR (8)
Work Centre Description VARCHAR (20)
Operation Short Text VARCHAR (40)
Long Text VARCHAR (2000)
Actual Work NUMERIC (13,3)
Actual Work UOM VARCHAR (3)
Actual Number Resources Integer
Original MTL No VARCHAR (40)
Original OP ID VARCHAR (65)
Scheduled Start Date Datetime
Action Integer
Normal_Duration DECIMAL (5,1)
Nuber_Resources NUMERIC (3)
Planned_Work DECIMAL (7,1)
Planned_Work_UOM VARCHAR (3)
Actual_Start_Date Datetime
Actual-Execution_Finish_Date Datetime
Latest_Planned_Finish_Date Datetime
Latest_scheduled_Finish_Date Datetime
Planned_Work_Activity DECIMAL (7,1)
Actual_Number_Resources NUMERIC (3)
OPERATIONS_DATA_PK (Work Order number, OpAc, Internal_
OPERATION SYSTEM STATUS
System Status VARCHAR (4)
Record Timestamp Datetime
System Status Description VARCHAR (40)
System Status Start Date Datetime
Rectification Block VARCHAR (2000)
Work Order number VARCHAR (12)
SubOperation VARCHAR (4)
Original MTL No VARCHAR (40)
Original OP ID VARCHAR (65)
Action Integer
OpAc NUMERIC (4)
Internal_Operation_ID NUMERIC (8)
OPERATION SYSTEM STATUS_PK (System Status,
STE_REQUIRED
Work Order number VARCHAR (12)
Cage Code VARCHAR (5)
MPN VARCHAR (34)
Description VARCHAR (40)
Quantity Required DECIMAL (13,3)
Unit of Issue VARCHAR (3)
Record Timestamp Datetime
Action Unknown
OpAc NUMERIC (4)
Internal_Operation_ID NUMERIC (8)
TOOL REQUIRED_PK (MPN, Cage Code)
STE_ASSIGNMENT
Work Order number VARCHAR (12)
Cage Code VARCHAR (5)
MPN VARCHAR (34)
Assigned Quantity DECIMAL (13,3)
Unit_of_Issue VARCHAR (3)
Action Integer
OpAc NUMERIC (4)
Internal_Operation_ID NUMERIC (8)
TOOLS - STE_PK (Cage Code, MPN)
STE_DETAIL
Serial_No VARCHAR (30)
Cage Code VARCHAR (5)
MPN VARCHAR (34)
STE_DETAIL_PK (Serial_No)
OPERATION USER STATUS
User Status VARCHAR (4)
Record Timestamp Datetime
User Status Description VARCHAR (40)
User Status Start Date Datetime
User Status Stop Date Datetime
Work Order number VARCHAR (12)
SubOperation VARCHAR (4)
Original Mtl No VARCHAR (40)
Original OP ID VARCHAR (65)
Action Integer
OpAc NUMERIC (4)
Internal_Operation_ID NUMERIC (8)
OPERATION USER STATUS_PK (User Status, Record Timestar
COMPONENT
Work Order number VARCHAR (12)
Component Item Number VARCHAR (10)
Record Timestamp Datetime
Cage Code VARCHAR (5)
MPN VARCHAR (34)
Description VARCHAR (40)
Long Text VARCHAR (2000)
Requirement Quantity DECIMAL (13,3)
Unit of Issue VARCHAR (3)
Action Integer
OpAc NUMERIC (4)
Internal_Operation_ID NUMERIC (8)
COMPONENT_PK (Component Item Number)

12 Document History

Revision Number	Description	Date
1.0	Ready for Navy RFP	15 October 2015
	-	