



Draft Standard MEF 57.2 Draft (R2)

Product Order Management Requirements and Use Cases

May 2021

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Table of Contents

1	List of Contributing Members	8
2	Abstract.....	2
3	Release Notes	2
4	Terminology and Abbreviations.....	2
5	Scope.....	4
6	Compliance Levels	5
7	Introduction.....	6
7.1	Product Specific Attributes.....	7
8	Product Ordering Use Cases and Business Process Definitions	8
8.1	High Level Use Cases.....	8
8.1.1	Product Ordering Management Use Cases	8
8.1.2	Product Order Operation Use Cases	11
8.1.3	Create Product Order Use Cases.....	12
8.1.4	Modify Product Order Item Completion Date	17
8.1.5	Cancel In-Flight Product Order	22
8.1.6	Charge	25
8.1.7	Notification Use Cases.....	33
8.2	Seller and Buyer Interaction for Non-Recurring or Updated Recurring Charges	35
8.2.1	Charge	35
8.2.2	Expedite Requested.....	36
8.2.3	Construction Charges.....	36
8.2.4	Connection Charges	36
9	Product Order Operation Attributes	37
9.1	Buyer and Seller Attributes	37
9.2	Product Order Attributes	38
9.2.1	Updatable Product Order Attributes	39
9.3	Product Order Item Attributes	40
9.3.1	Updatable Product Order Item Attributes	45
9.3.2	Non-Updatable Product Order Item Attributes.....	46
9.4	Modify Product Item Date Request Attributes	46
9.5	Cancel Product Order Request Attributes	48
9.6	Contact Attributes.....	49
9.7	Buyer Billing Attributes	50
9.8	Product Order Item Relationship Attributes	50
9.9	Product Order Item Coordinated Action	51
9.10	Product Relationship Attributes.....	52
9.11	Notification Registration Attributes	52
9.12	Notification Attributes	54
9.13	Place Relationship Attributes	55
9.14	Note Attributes	56
9.15	Charge Attributes.....	57
9.16	Charge Item Attributes	58

9.17	Price Attributes	60
9.18	Term Attributes.....	60
9.19	Appointment Attributes	61
9.20	POQ Item Reference Attributes.....	61
9.21	Quote Item Reference Attributes	62
9.22	Duration	63
10	Product Order Requirements	64
10.1	Create Product Order	64
10.1.1	Buyer Create Product Order Request Product Order Level Attributes	64
10.1.2	Create Product Order Seller Create Product Order Initial Response Product Order Level	65
10.1.3	Seller Product Order Lifecycle Updates Product Order Level	65
10.1.4	Buyer Create Product Order Product Order Item Common Requirements	66
10.1.5	Seller Create Product Order Initial Response Product Order Item Common Requirements	67
10.1.6	Seller Lifecycle Response Product Order Item Common Requirements.....	68
10.1.7	Buyer Create Product Order Product Order Item with Product Action INSTALL	68
10.1.8	Seller Create Product Order Initial Response Product Order Item with Product Action INSTALL	68
10.1.9	Seller Create Product Order Lifecycle Response Product Order Item with Product Action INSTALL	69
10.1.10	Buyer Create Product Order Product Order Item Product Action CHANGE	69
10.1.11	Seller Create Product Order Initial Response Product Order Item with Product Action CHANGE	70
10.1.12	Seller Product Order Lifecycle Response Product Order Item with Product Action CHANGE	70
10.1.13	Buyer Create Product Order Product Order Item Product Action DISCONNECT	70
10.1.14	Seller Create Product Order Initial Response with Product Order Item Product Activity DISCONNECT	71
10.1.15	Seller Create Product Order Lifecycle Response with Product Order Item Product Activity DISCONNECT	71
10.2	Update Product Order Attributes	71
10.2.1	Buyer Update Product Order Attributes Request.....	71
10.2.2	Seller Update Product Order Attributes Response.....	72
10.3	Update Product Order Item Attributes.....	72
10.3.1	Buyer Update Product Order Item Attributes Request	72
10.3.2	Seller Update Product Order Attributes Response.....	73
10.4	Modify Product Order Item Completion Date	73
10.4.1	Expedite Product Order Item	73
10.4.2	Modify Product Order Item Requested Completion Date	74
10.5	Charge.....	75
10.5.1	Initiate Charge.....	75
10.6	Buyer Response to Charge	76
10.7	Create Cancel Product Order Request	76
10.7.1	Buyer Create Cancel Product Order Request.....	77
10.7.2	Seller Create Cancel Product Order Response.....	77
10.8	Retrieve Product Order List.....	78
10.8.1	Buyer Retrieve Product Order List Request	78
10.8.2	Seller Retrieve Product Order List Response	78
10.9	Retrieve Product Order by Product Order Identifier	79
10.9.1	Buyer Retrieve Product Order by Product Order Identifier Request.....	79

10.9.2	Seller Query Product Order by Identifier Response	79
10.10	Retrieve Modify Product Order Item Completion Date List	83
10.10.1	Buyer Retrieve Modify Product Order Item Completion Date List Request.....	83
10.10.2	Seller Retrieve Product Order Item Date List Response	83
10.11	Retrieve Modify Product Order Item Completion Date Details by Modify Product Order Item Completion Date Identifier.....	84
10.11.1	Buyer Retrieve Modify Product Order Item Completion Date Details by Modify Product Order Item Completion Date Identifier Request	84
10.11.2	Seller Retrieve Modify Product Order Item Completion Date Details by Modify Product Order Item Completion Date Identifier Response.....	84
10.12	Retrieve Cancel Product Order List.....	85
10.12.1	Buyer Retrieve Cancel Product Order List Request	85
10.12.2	Seller Retrieve Cancel Product Order List Response	85
10.13	Retrieve Cancel Product Order by Seller Cancel Product Order Identifier	86
10.13.1	Buyer Retrieve Cancel Product Order by Seller Cancel Product Order Identifier Request ..	86
10.13.2	Seller Retrieve Cancel Product Order by Seller Cancel Product Order Identifier Response	86
10.14	Retrieve Charge List.....	87
10.14.1	Buyer Retrieve Charge List Request.....	87
10.14.2	Seller Retrieve Charge List Response.....	87
10.15	Retrieve Charge Details by Charge Identifier	88
10.15.1	Buyer Retrieve Charge Details by Charge Identifier Charge Request	88
10.15.2	Seller Retrieve Charge Details by Charge Identifier Charge Response	88
10.16	Register for Notifications	89
10.16.1	Buyer Register for Notifications Request.....	89
10.16.2	Seller Register for Notification Response.....	90
10.17	Seller Send Notification.....	90
10.18	Specifying the Buyer Identifier and the Seller Identifier	90
11	Product Ordering State Machines.....	91
11.1	Product Order State Machines	91
11.2	Product Order Item State Machine	94
11.3	Modify Product Order Item Date Process State Machine	97
11.4	Cancel Product Order Process State Machine	99
11.5	Charge State Machines	101
11.5.1	Charge Process Flow.....	101
11.5.2	Charge Item Process States and State Machine	102
12	References.....	104
Appendix A	Interactions Between Process Flows	105
A.1	Product Order Item to Product Order Interactions	105
A.2	Product Order to Product Order Item Interactions	106

List of Figures

Figure 1 – LSO Reference Architecture Diagram	7
Figure 2 – Product Order Use Cases	9
Figure 3 – Product Order Process Flow	92
Figure 4 – Sonata Product Order Item Process Flow	95
Figure 5 – Modify Product Order Item Completion Date Process Flow	98
Figure 6 – Cancel Product Order Process Flow	100
Figure 7 – Charge Process Flow	102
Figure 8 – Charge Item Process	103

List of Tables

Table 1 – Terminology and Abbreviations	3
Table 2 – MEF Product Order Use Case Summary	11
Table 3 – Create New Product Order Request Use Case.....	13
Table 4 – Product Order Item for New Product.....	14
Table 5 – Product Order Item to Change Existing Product	14
Table 6 – Product Order Item to Disconnect Existing Product	15
Table 7 – Update Product Order Use Case	15
Table 8 – Retrieve List of Product Orders Use Case	16
Table 9 – Retrieve Product Order by Product Order Identifier Use Case	17
Table 10 – Modify Product Order Item Completion Date (Expedite Indicator) Use Case.....	19
Table 11 – Modify Product Order Item Completion Date (Requested Completion Date) Use Case	20
Table 12 – Retrieve List of Modify Product Order Item Dates Use Case	21
Table 13 – Retrieve Modify Product Order Item Date by Identifier Use Case	22
Table 14 – Cancel In-Flight Product Order Request Use Case	23
Table 15 – Retrieve List of Cancel In-Flight Product Order Requests Use Case.....	24
Table 16 – Retrieve Cancel In-Flight Product Order Request by Cancel Request Identifier Use Case.....	25
Table 17 – Initiate Charge Use Case.....	25
Table 18 – Initiate Charge Use Case.....	26
Table 19 – Initiate Charge Use Case Associated with Modify Product Order Item Completion Date.....	27
Table 20 – Initiate Charge Use Case Associated with Cancel Product Order	28
Table 21 – Respond to Charge Use Case.....	29
Table 22 – Respond to Charge Associated to Product Order Item Use Case	30
Table 23 – Respond to Charge Associated to Modify Product Order Item Completion Date Use Case.....	31
Table 24 – Respond to Charge Associated to Cancel Product Order Use Case	31
Table 25 – Retrieve List of Charges Use Case	32
Table 26 – Retrieve Charge by Charge Identifier Use Case	33
Table 27 – Register for Notifications Use Case.....	34
Table 28 – Send Notification Use Case	35
Table 29 – Buyer and Seller Attributes.....	37
Table 30 – Product Order Attributes.....	39
Table 31 – Updatable Product Order Attributes	40
Table 32 – Product Order Item Attributes	45
Table 33 – Updatable Product Order Item Attributes	46
Table 34 – Non-Updatable Product Order Item Attributes.....	46
Table 35 – Modify Product Order Item Date Attributes.....	47
Table 36 – Cancel Product Order Attributes.....	49
Table 37 – Contact Attributes	49
Table 38 – Buyer Billing Attributes.....	50
Table 39 – Product Order Item Relationship Attributes	51
Table 40 – Product Order Item Coordination Action Attributes	51
Table 41 – Product Relationship Attributes.....	52

Table 42 – Register for Notifications Buyer Attributes	53
Table 43 – Seller Notification Attributes	55
Table 44 – Place Relationship Attributes	56
Table 45 – Note Attributes	57
Table 46 – Charge Attributes	58
Table 47 – Charge Item Attributes	60
Table 48 – Price Attributes	60
Table 49 – Term Attributes	61
Table 50 – POQ Item Reference Attributes	62
Table 51 – Quote Item Reference Attributes	63
Table 52 – Duration Attributes	63
Table 53 – Price Type Required Information	76
Table 54 – Seller Response Product Order Attributes Based on Product Order State	80
Table 55 – Seller Response Product Order Attributes Based on Product Order State	82
Table 56 – Seller’s Response Based on Cancel State	87
Table 57 – Seller’s Response Based on Charge State	89
Table 58 – Seller’s Response Based on Charge Identifier State	89
Table 59 – Product Order Process Flow States	94
Table 60 – Product Order Item Process Flow States	97
Table 61 – Modify Product Order Item Completion Date Process Flow States	99
Table 62 – Cancel Process Flow States	101
Table 63 – Charge Process Flow States	102
Table 64 – Charge Item Process Flow States	103
Table 65 – Product Order Item COMPLETED to Product Order State Mapping	105
Table 66 – Product Order Item REJECTED to Product Order State Mapping	105
Table 67 – One Product Order Item FAILED to Product Order State Mapping	106
Table 68 – All Product Order Items FAILED to Product Order State Mapping	106
Table 69 – Product Order COMPLETED to Product Order Item State Mapping	106
Table 70 – Product Order REJECTED to Product Order Item State Mapping	107
Table 71 – Product Order PARTIAL to Product Order Item State Mapping	107
Table 72 – All Product Order Items FAILED to Product Order State Mapping	107

1 List of Contributing Members

The following members of the MEF participated in the development of this document and have requested to be included in this list.

Editor Note 1: This list will be finalized before Letter Ballot. Any member that comments in at least one CfC is eligible to be included by opting in before the Letter Ballot is initiated. Note it is the MEF member that is listed here (typically a company or organization), not their individual representatives.

- **ABC Networks**
- **XYZ Communications**

2 Abstract

This specification identifies the common Product Order Use Cases and attributes needed to support inter-carrier Product Order management. It supports the requirements defined in the MEF Lifecycle Service Orchestration (LSO) Reference Architecture and Framework (MEF 55 [5], “LSO RA”) requirements for Product Order Management over the Sonata interface (Service Provider <-> Partner interactions). Requirements and Use Cases contained within this specification will be utilized by both Buyer and Seller Product Order systems for the development of APIs.

3 Release Notes

This document is currently undergoing its third Call for Comments Ballot. Comments that are received in the Call for Comments Ballot will be addressed in the next working draft of the document. Because of the on-going Call for Comment Ballot, the contents of this document are subject to change.

4 Terminology and Abbreviations

This section defines the terms used in this document. In many cases, the normative definitions to terms are found in other documents. In these cases, the third column is used to provide the reference that is controlling, in other MEF or external documents.

In addition, terms defined in the standards referenced below are included in this document by reference and are not repeated in the table below:

- MEF 50.1
- MEF 51.1
- MEF 55.1
- MEF 79
- MEF 80

Term	Definition	Reference
Confirmation_And_Engineering_Design	A notification that identifies that the Confirmation and Engineering Design is available. The exchange of the design information is beyond the scope of this document. Create Product Order	This document
Confirmation_Only	A response to a Create Product Order request that confirms the Seller has received the Product Order Request.	This document
Connection Charge	A one-off charge set by the Seller to connect a Product Order Item to the Seller’s network.	This document

Term	Definition	Reference
Construction Charge	A one-off charge set by the Seller resulting from special construction required to provide a Buyer requested Product Order Item.	This document
Disconnect Charge	A one-off charge set by the Seller that results from a request by the Buyer to disconnect a Product.	This document
Duration	A period of time specified in seconds, minutes, hours, business hours, business days, or calendar days.	MEF 80 [10]
Expedite Charge	A one-off charge set by the Seller resulting from a request by the Buyer to expedite the Product Order Item.	This document
Identifier	An attribute type that contains no more than 45 characters and no spaces.	This document
In-Flight	A Product Order Item that the Seller is still actively working on or intends to start or continue to work on. A Product Order is considered In-Flight when at least one of the Product Order Item it contains is In-Flight. An In-Flight Product Order may be updated or cancelled.	This document
In-Flight Cancellation Charge	A charge set by the Seller that results from the cancellation of a Product Order that is In-Flight.	This document
Monthly Recurring Charge	A charge set by the Seller for the Product that occurs each month.	This document
MRC	Monthly Recurring Charge	This document
Point of No Return	A point in the fulfilment of a Product Order Item past which a Seller is unable or unwilling to accept a cancellation request on it. A Product Order is considered past the Point of No Return when all of its Product Order Items have reached their Point of No Return.	This document
Telecommunication Service Priority	A US centric term used to assign a priority for restoration of a Product in the event of a natural or other disaster impacting multiple Products.	This document

Table 1 – Terminology and Abbreviations

5 Scope

This specification defines the process for MEF Product Order Management between a Seller and Buyer. This specification is limited to the business process requirements depicted as Use Cases and Attribute definitions needed for Product Order Management.

6 Compliance Levels

The key words "**MUST**", "**MUST NOT**", "**REQUIRED**", "**SHALL**", "**SHALL NOT**", "**SHOULD**", "**SHOULD NOT**", "**RECOMMENDED**", "**NOT RECOMMENDED**", "**MAY**", and "**OPTIONAL**" in this document are to be interpreted as described in BCP 14 (RFC 2119 [1], RFC 8174 [3]) when, and only when, they appear in all capitals, as shown here. All key words must be in bold text.

Items that are **REQUIRED** (contain the words **MUST** or **MUST NOT**) are labeled as [Rx] for required. Items that are **RECOMMENDED** (contain the words **SHOULD** or **SHOULD NOT**) are labeled as [Dx] for desirable. Items that are **OPTIONAL** (contain the words **MAY** or **OPTIONAL**) are labeled as [Ox] for optional.

Editor Note 2: The following paragraph will be deleted if no conditional requirements are used in the document.

A paragraph preceded by [CRa]< specifies a conditional mandatory requirement that **MUST** be followed if the condition(s) following the "<" have been met. For example, "[CR1]<[D38]" indicates that Conditional Mandatory Requirement 1 must be followed if Desirable Requirement 38 has been met. A paragraph preceded by [Cdb]< specifies a Conditional Desirable Requirement that **SHOULD** be followed if the condition(s) following the "<" have been met. A paragraph preceded by [COc]< specifies a Conditional Optional Requirement that **MAY** be followed if the condition(s) following the "<" have been met.

7 Introduction

This specification defines the business requirements and process-related guidelines for the Product Ordering process over the Sonata interface. The Sonata interface is defined in MEF 55.1 [6] and MEF 55.0.1 [7] as the Management Interface Reference Point supporting the management and operations interactions (e.g., Product Ordering, billing, trouble management, etc.) between two network providers (Service Provider Domain and Partner Domain). The scope of this document is limited to interactions between these parties; within this document, they are referred to as the “Buyer” and the “Seller”.

The Buyer submits a Product Order request containing one or more Product Order items. The Buyer may place a Product Order for an installation (Install) of a new service, Change to an existing service, or a Disconnect of an existing service. Product Orders that are in-progress (In-Flight) may be cancelled by the Buyer and some Product Order and Product Order Item attributes may be updated by the Buyer. Product Order status may be queried by the Buyer. The Seller processes the Product Order and provides notifications to the Buyer of Product Order status at several milestones in the process. When the Product Order has been processed the Seller notifies the Buyer that the Product Order is complete.

To fully define the business interactions associated with inter-carrier Product Ordering, this document is focused on the following key areas: section 8 defines the Use Cases and Product Order Management Scenarios, section 9 defines the specific Product Ordering attributes associated with the Product Orders supported in this document, and section 11 provides the State Diagrams for Product Ordering.

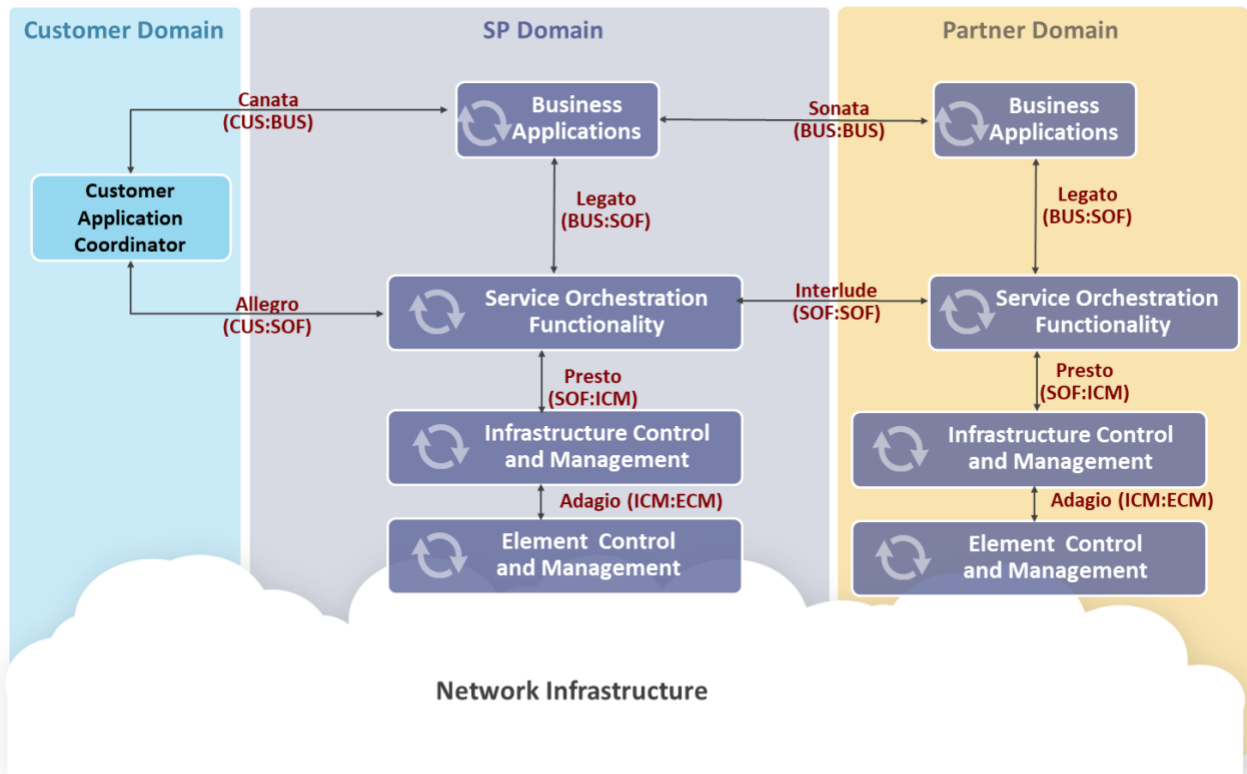


Figure 1 – LSO Reference Architecture Diagram

Figure 1 depicts the LSO Reference Architecture, per MEF 55 [5]. This document addresses the interactions between the business applications of the Service Provider (“Buyer”) and Partner domains (“Seller”) required to support the buying and selling of MEF defined services. Various supporting business functions may be utilized prior to initiation of the Product Ordering process. Such functions are outside the scope of this document.

It is important to note that specifications related to Service Provider-Partner interactions outside the submission of a Product Order are also not in the scope of this document.

7.1 Product Specific Attributes

This document provides the use cases and requirements for a product agnostic interface. It does not include, except when used in examples, specific products or product attributes. Product specific attribute documents or models address these, and they are referred to as Product Specific Attributes within this document.

These attributes include not just variables for the product but also items like milestones that are included in notifications sent from Seller to Buyer.

8 Product Ordering Use Cases and Business Process Definitions

8.1 High Level Use Cases

This section provides the complete set of Use Cases needed to support the Product Ordering of services and expands on the Product Ordering process defined in MEF 50.1 [4]. These Use Cases are based on business process standards of interactivity between Product Ordering entities and suppliers. Each use case drives the need for specific Product Ordering information, and administrative process tracking objects. The specific attributes associated with each Use Case are defined in section 9. Prior arrangements for Buyer authentication, security verification, and system interface requirements are not addressed within these use cases. All onboarding requirements must be defined and negotiated between the Buyer and Seller prior to the submission of any requests or responses including what Product Orders a Buyer may retrieve information about.

It is expected that a catalog will be utilized to identify all products and services available for each Buyer. The requirements for how a catalog is used within the Product Ordering process are outside the scope of this document.

8.1.1 Product Ordering Management Use Cases

This section defines the use cases that support the end-to-end lifecycle of Product Order Management of Services. The term “service” within this document pertains to the deployed Service realized as a result of a Product Order.

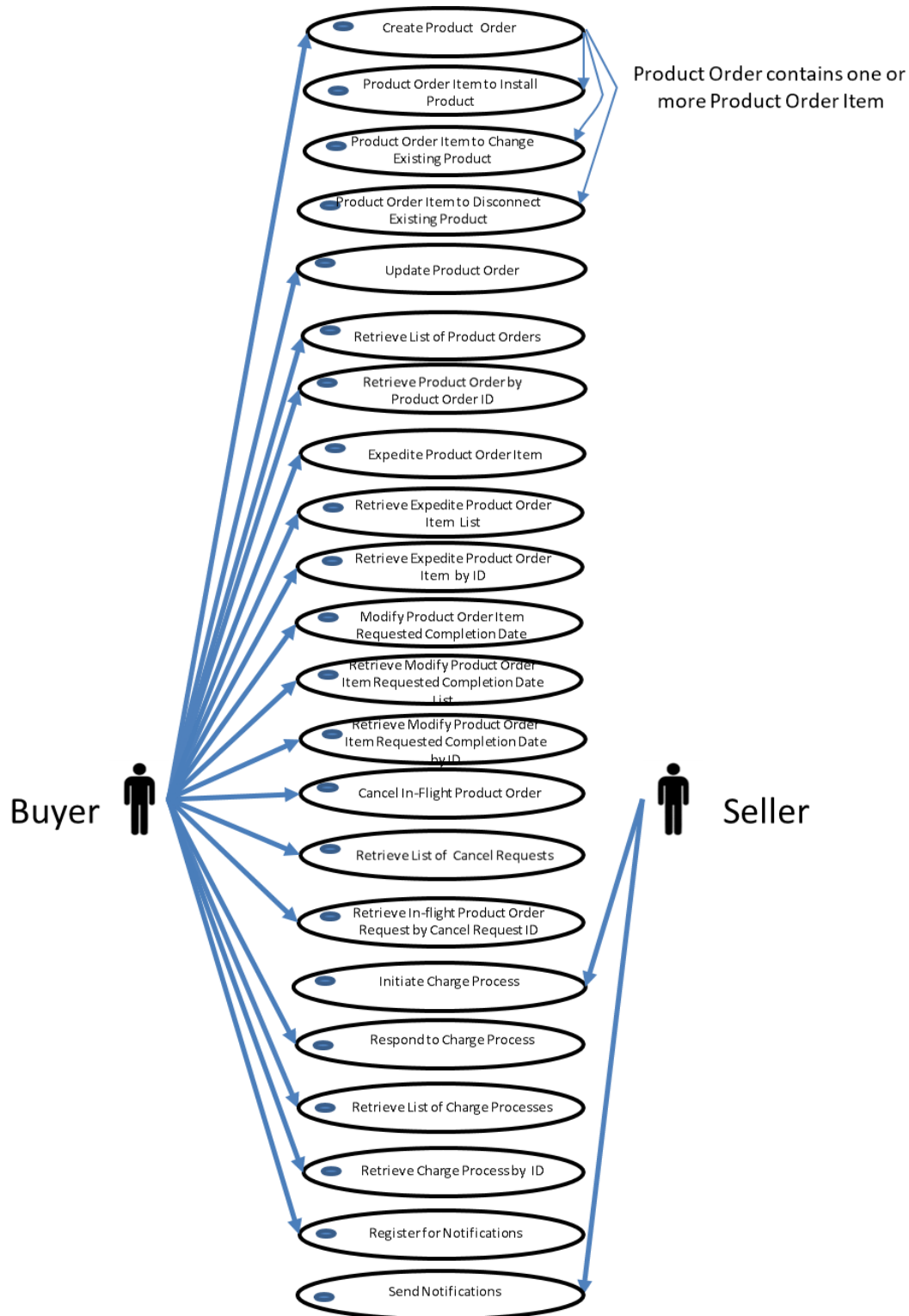


Figure 2 – Product Order Use Cases

Figure 2 indicates which party may initiate the process defined in the Use Case.

Use Case #	Use Case Name	Use Case Description
1	Create Product Order	A request initiated by the Buyer to Product Order a new product or service component(s). A Product Order must contain at least one Product Order Item (Use Case # 1-a, 1-b, or 1-c) as shown below. A Product Order may contain more than one Product Order Item and Product Order Items within a Product Order are not required to have relationships between them.
1-a	Product Order Item to Install Product	Product Order Item installs a new Product.
1-b	Product Order Item to Change Existing Product	Product Order Item changes attributes of a specific active Product.
1-c	Product Order Item to Disconnect Existing Product	Product Order Item disconnects an active Product.
2	Update Product Order	Allows the Buyer to update some Product Order and Product Order Item Attributes
3	Retrieve List of Product Orders	A request initiated by the Buyer to retrieve a list of Product Orders that match the provided filter criteria
4	Retrieve Product Order by Product Order Identifier	A request initiated by the Buyer to retrieve the details associated with a specific Product Order with the given Product Order Identifier.
5	Modify Product Order Item Completion Date	A request initiated by the Buyer to modify either the Expedite Indicator or the Requested Completion Date of a Product Order Item.
6	Retrieve Modify Product Order Item Completion Date List	A request initiated by the Buyer to retrieve a list of Modify Product Order Item Completion Date that match the provided filter criteria
7	Retrieve Modify Product Order Item Completion Date by Identifier	A request initiated by the Buyer to retrieve the details associated with a specific Modify Product Order Item Date with the given Modify Product Order Item Completion Date Identifier.
8	Cancel In-Flight Product Order	A request initiated by the Buyer to cancel an In-Flight Product Order.
9	Retrieve List of Cancel Requests	A request initiated by the Buyer to retrieve a list of Cancel Requests that match the provided filter criteria

Use Case #	Use Case Name	Use Case Description
10	Retrieve Cancel of In-Flight Product Order Request by Cancel Request Identifier	A request initiated by the Buyer to retrieve the details associated with a specific Cancel Request with the given Cancel Request Identifier.
11	Initiate Charge	Process to communicate charges from the Seller to Buyer
12	Respond to Charge	Process to communicate if the Buyer accepts or rejects the charges.
13	Retrieve List of Charges	A request initiated by the Buyer to retrieve a list of Charges that match the provided filter criteria
14	Retrieve Charge by Identifier	A request initiated by the Buyer to retrieve the details associated with a specific Charge with the given Charge Identifier.
15	Register for Notifications	The Buyer requests to subscribe to notifications.
16	Send Notification	A notification initiated by the Seller to the Buyer providing subsequent status information on Product Order, Cancel Requests, and Charges.

Table 2 – MEF Product Order Use Case Summary

Note: In some cases, a Seller may initiate a Cancel or Disconnect Product Order within their Product Order system. They do not use the API between Buyer and Seller to initiate these Product Orders and therefore this is not addressed within the scope of this document. If a Seller Cancels a Product Order the Seller sends a notification to the Buyer. Identifier

8.1.2 Product Order Operation Use Cases

This section defines the details for each of the Product Order Management Use Cases. The following assumptions are made for these Use Cases:

- The electronic method for sending the Product Order will be the same as the electronic method for sending the responses.
- The Buyer has determined the target Seller (Partner/Access Provider). Partner selection is out-of-scope.
- The Buyer and the Seller have established a partnership agreement (which might include interconnection inventory).

8.1.3 Create Product Order Use Cases

The following Use Cases are contained in this section:

- Create New Product Order
 - Product Order Item to Install Product
 - Product Order Item to Change Existing Product
 - Product Order Item to Disconnect Existing Product
- Update Product Order
- Retrieve Product Order List
- Retrieve Product Order by Product Order Identifier

8.1.3.1 Create Product Order Use Case

The Create Product Order Use Case and sub-Use Cases are detailed in this section.

Field	Description
Use Case #	1
Use Case Name	Create Product Order
Description	A request initiated by the Buyer to create a Product Order
Actors	Buyer, Seller
Pre-Conditions	<ol style="list-style-type: none"> 1. The Buyer must be authorized to purchase products from the Seller (Buyer on-boarded). 2. The Buyer may have completed pre-Product Order inquiries/serviceability request. 3. The Buyer may have completed a quoting process to obtain pricing information.
Process Steps	<ol style="list-style-type: none"> 1. The Buyer initiates and submits a Create Product Order request that contains at least one Product Order Item as described in Use Cases 1-a, 1-b, or 1-c. See those use cases for Process Steps for each Product Order Item. 2. The Seller validates the Create Product Order request and each Product Order Item it contains as per Use Cases 1-a, 1-b, and 1-c. 3. If a POQ reference is provided for the Product Order Item, the Seller may verify that the attributes in the Product Order Item match the

	<p>attributes in the Create POQ response. The value of some attributes may not be validated until the fulfillment process.</p> <ol style="list-style-type: none"> If a Quote reference is provided for the Product Order Item, the Seller may verify that the attributes in the Product Order Item match the attributes in the Create Quote response. The value of some attributes may not be validated until the fulfillment process. The Seller accepts the Create Product Order Request and provides a response with an assigned Seller Product Order Identifier. The state of the Product Order is set to “ACKNOWLEDGED” by the Seller.
Post-Conditions	<ol style="list-style-type: none"> The "ACKNOWLEDGED" Product Order is ready for processing including additional business rule validation. Seller initiates Product Order processing. If the Seller supports notifications and the Buyer has registered for notifications, the Seller notifies the Buyer of commitment to provide the requested product by a specific date.
Alternative Paths	<ol style="list-style-type: none"> The Seller returns an error message if an error is encountered while processing that prevents the Seller from acknowledging the Product Order.

Table 3 – Create New Product Order Request Use Case

Note: The maximum number of Product Order Items in a Create New Product Order request is agreed to by the Buyer and Seller.

A Create New Product Order request contains one or more Product Order Items. Each Product Order Item has a Product Order Item Product Action that defines if the Product Order Item is an Install of a Product, a Change to an existing Product, or a Disconnect of a Product. Changes allowed to an existing Product are agreed to by the Seller and Buyer. These actions are detailed in Use Cases 1-a, 1-b, and 1-c.

In some cases, the actions of related Product Order Items need to be coordinated as agreed to by the Buyer and Seller. The Product Actions may be the same or different actions. A Buyer includes these Product Order Items in a Create Product Order request and defines the relationships between the Product Order Items using the attribute that indicate these relationships.

Field	Description
Sub-Use Case #	1-a
Sub-Use Case Name	Product Order Item to Install Product
Description	Describes the sub-Use Case that includes a Product Order Item that has a Product Action of INSTALL

Process Steps	<ol style="list-style-type: none"> 1. A Product Order Item with the Product Order Item Action of INSTALL and including the Product Offering Identifier for the product being Product Ordered is included in a Create New Product Order request. 2. The Seller validates the Product Order Item. 3. The state of the Product Order Item is set to “ACKNOWLEDGED” by the Seller.
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Table 4 – Product Order Item for New Product

Field	Description
Sub-Use Case #	1-b
Sub-Use Case Name	Product Order Item to Change Existing Product
Description	Describes the sub-Use Case that includes a Product Order Item with a Product Order Item Action of CHANGE.
Process Steps	<ol style="list-style-type: none"> 1. The Buyer submits a Create New Product Order Request with a Product Order Item with the Product Order Item Action of CHANGE and the Product to be changed. 2. The Seller validates the Product Order Items. 3. The Seller accepts the Create New Product Order Request and provides a response with an assigned Seller Product Order Identifier. The state of the Product Order is set to “ACKNOWLEDGED” by the Seller.

Table 5 – Product Order Item to Change Existing Product

Note: if the Seller is unable to support the request to change an existing Product, they return an error.

Field	Description
Sub-Use Case #	1-c
Sub Use Case Name	Product Order Item to Disconnect Existing Product
Description	Describes the sub-Use Case that includes a Product Order Item with a Product Order Item Action of DISCONNECT.
Process Steps	<ol style="list-style-type: none"> 1. The Buyer submits a Create New Product Order request with a Product Order Item with the Product Order Item Action of DISCONNECT and the Product to be disconnected. 2. The Seller validates the Create New Product Order request and Product Order Items.

	3. The Seller accepts the Create New Product Order request and provides a response with an assigned Seller Product Order Identifier. The state of the Product Order is set to “ACKNOWLEDGED” by the Seller.
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Table 6 – Product Order Item to Disconnect Existing Product

8.1.3.2 Update Product Order

The Update Product Order Use Case is detailed in this section.

Field	Description
Use Case #	2
Use Case Name	Update Product Order
Description	A request initiated by the Buyer to update Product Order and/or Product Order Item Attributes.
Actors	Buyer, Seller
Pre-Conditions	<ol style="list-style-type: none"> 1. The Buyer must be authorized to perform the query. 2. A set of Product Order and Product Order Item Attributes that may be modified has been defined. 3. The Product Order must be In-Flight.
Process Steps	<ol style="list-style-type: none"> 1. The Buyer submits a Modify Product Order request as shown in section including the Product Order and/or Product Order Item Attributes that are to be modified with the current and future Attribute values. 2. The Seller receives the request and validates the request. 3. The Seller determines if the attributes are eligible to be modified. 4. The Seller updates the specified attributes to the new value.
Post-Conditions	<ol style="list-style-type: none"> 1. The Buyer updates specific Product Order and/or Product Order Item Attribute values are updated.
Alternative Paths	<ol style="list-style-type: none"> 1. If errors are encountered, the Seller returns all identified the errors in a reject response. 2. If the attributes cannot be updated the Seller returns an error.

Table 7 – Update Product Order Use Case

8.1.3.3 Retrieve Product Order List

The Retrieve Product Order List Use Case is detailed in this section.

Field	Description
Use Case #	3
Use Case Name	Retrieve List of Product Orders
Description	A request initiated by the Buyer to retrieve a list of Product Orders that match the provided filter criteria.
Actors	Buyer, Seller
Pre-Conditions	1. The Buyer must be authorized to perform the query.
Process Steps	<ol style="list-style-type: none"> 1. The Buyer submits a Retrieve List of Product Order request as shown in section 10.8.1 including filter criteria the Seller should apply. 2. The Seller receives the request and validates the request. 3. The Seller determines if any Product Orders that match the filter criteria in the request. 4. The Seller returns a list of summarized Product Order instances as specified in section 10.8.2
Post-Conditions	<ol style="list-style-type: none"> 1. The Buyer receives a list of all Product Orders that match the Buyer's selection criteria. 2. The Buyer may initiate Use Case 3 to obtain detailed information for a specific Seller Product Order Identifier.
Alternative Paths	<ol style="list-style-type: none"> 1. If errors are encountered, the Seller returns all identified errors in a reject response. 2. If the quantity of records exceeds a Seller's policy, the Seller must choose to respond with either: <ul style="list-style-type: none"> • an empty list and message that indicates the result set is too large and submit a new more specific query or • a response that indicates the result is too large and includes a subset of the matching Product Orders. 3. If the query does not find any matching records, then the Seller responds with an indication of this result.

Table 8 – Retrieve List of Product Orders Use Case

Note: The maximum number of records to be returned will be determined by the Seller.

8.1.3.4 Retrieve Product Order by Product Order Identifier Use Case

The Retrieve Product Order by Product Order Identifier Use Case is detailed in this section.

Field	Description
Use Case #	4
Use Case Name	Identifier Retrieve Product Order by Product Order Identifier
Description	A request initiated by the Buyer to retrieve the details of a Product Order with the given Product Order Identifier. This includes all Product Order and Product Order Item attributes.
Actors	Buyer, Seller
Pre-Conditions	<ol style="list-style-type: none"> 1. The Buyer knows the Product Order Identifier they want to retrieve details on. 2. A Product Order Identifier exists in the Seller's system and the Product Order is available for online retrieval. <p>Note: Any Product Order submitted by the Buyer that exists in the Seller's system must be able to be retrieved via the API</p>
Process Steps	<ol style="list-style-type: none"> 1. The Buyer initiates a Retrieve Product Order by Product Order Identifier request to the Seller using the Seller Product Order Identifier. 2. The Seller responds to the Retrieve Product Order by Product Order Identifier request with the up to date view of the Product Order and its associated Product Order Items as specified in Table 29, Table 30, and Table 32 and the Charge Identifier and state as specified in Table 47.
Post-Conditions	<ol style="list-style-type: none"> 1. The Buyer has detailed information on the Product Order with the given Seller Product Order Identifier.
Alternative Paths	<ol style="list-style-type: none"> 1. If errors are encountered, the Seller returns all identified errors in a reject response and the Buyer may submit a new query. 2. If the Product Order is not found, the Buyer must receive a response indicating this. 3. If the Buyer is not authorized to retrieve the Product Order, the Buyer must receive a response indicating this. 4. If the Seller has archived a Product Order after reaching a final state, the Seller may return an error because it is no longer possible to retrieve the Product Order.

Table 9 – Retrieve Product Order by Product Order Identifier Use Case

Note: The timeframe that a Product Order in the final state remains able to be retrieved is agreed to by the Buyer and Seller.

8.1.4 Modify Product Order Item Completion Date

The following Use Cases are contained in this section:

- Modify Product Order Item Completion Date Request
- Retrieve List of Modify Product Order Item Completion Date Requests
- Retrieve Modify Product Order Item Completion Date by Identifier

8.1.4.1 Modify Product Order Item Completion Date

The Modify Product Order Item Requested Completion Date Use Cases are detailed in this section.

Field	Description
Use Case #	5a
Use Case Name	Modify Product Order Item Completion Date (Expedite Indicator) Request
Description	A request initiated by the Buyer to modify the Expedite Indicator of a Product Order Item.
Actors	Buyer, Seller
Pre-Conditions	<ol style="list-style-type: none"> 1. An In-Flight Product Order exists in the Seller's system. 2. The Buyer can modify Product Order Items within the Product Order. Buyers may only modify Product Order Items within Product Orders that they initiated.
Process Steps	<ol style="list-style-type: none"> 1. The Buyer initiates a Modify Product Order Item Request setting the Expedite Indicator to TRUE. 2. The Seller validates the Modify Product Order Item Completion Date Request. 3. Seller initiates the Modify Date process, sets the Modify Product Order Item Completion Date state to ACKNOWLEDGED, the Seller assigns a unique Modify Process Identifier, and changes the state of the referenced Product Order to ASSESSING_MODIFICATION. 4. The Seller notifies the Buyer of any charges resulting from modifying the referenced Product Order while the Modify Product Order Item Completion Date is in the ACKNOWLEDGED state. (See Charge as described in section 8.1.6 for details on this). 5. The Seller accepts the Modify Product Order Item Completion Date. The Modify Product Order Item Completion Date is set to ACCEPTED and Seller updates the Product Order Item Expedite Indicator and the Product Order Item Expedite Accepted Indicator. 6. The Seller sets the referenced Product Order state to IN_PROGRESS. 7. The Seller continues their work to fulfill the Product Order.
Post-Conditions	<ol style="list-style-type: none"> 1. The Expedite Indicator and Expedite Accepted Indicator of the specified Product Order Item are updated.

Alternative Paths	<ol style="list-style-type: none"> 1. The Seller returns an error message if an error is encountered while processing that prevents the Seller from completing the request. 2. The Seller may determine that the Product Order Item cannot be modified and may reject the request. The Seller sets the state of the Modify Product Order Item Completion Date to REJECTED and returns the referenced Product Order to IN_PROGRESS.
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Table 10 – Modify Product Order Item Completion Date (Expedite Indicator) Use Case

Field	Description
Use Case #	5b
Use Case Name	Modify Product Order Item Completion Date (Requested Completion Date) Request
Description	A request initiated by the Buyer to modify the Requested Completion Date of a Product Order Item.
Actors	Buyer, Seller
Pre-Conditions	<ol style="list-style-type: none"> 1. An In-Flight Product Order exists in the Seller's system. 2. The Buyer can modify Product Order Items within the Product Order. Buyers may only modify Product Order Items within Product Orders that they initiated.
Process Steps	<ol style="list-style-type: none"> 1. The Buyer initiates a Modify Product Order Item Completion Date Request which includes the modified Product Order Item Requested Completion Date. 2. The Seller validates the Modify Product Order Item Completion Date Request. 3. Seller initiates the Modify process, sets the Modify Product Order Item Completion Date state to ACKNOWLEDGED, the Seller assigns a unique Modify Process Identifier, and changes the state of the referenced Product Order to ASSESSING_MODIFICATION. 4. The Seller notifies the Buyer of any charges resulting from modifying the referenced Product Order while the Modify Product Order Item Completion Date is in the ACKNOWLEDGED state. (See Charge as described in section 8.1.6 for details on this). 5. The Seller accepts the Modify Product Order Item Completion Date. The Modify Product Order Item Completion Date is set to ACCEPTED and Seller updates the Product Order Item Requested Completion Date. 6. The Seller sets the referenced Product Order state to IN_PROGRESS. 7. The Seller continues their work to fulfill the Product Order.
Post-Conditions	<ol style="list-style-type: none"> 1. The Requested Completion Date of the specified Product Order Item is updated.

Alternative Paths	<ol style="list-style-type: none"> 1. The Seller returns an error message if an error is encountered while processing that prevents the Seller from completing the request. 2. The Seller may determine that the Product Order Item cannot be modified and may reject the request. The Seller sets the state of the Modify Product order Item Requested Completion Date to REJECTED and returns the referenced Product Order to IN_PROGRESS.
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Table 11 – Modify Product Order Item Completion Date (Requested Completion Date) Use Case

8.1.4.2 Retrieve Modify Product Order Item Completion Date List

The Retrieve Modify Product Order Item Completion Date List Use Case is detailed in this section.

Field	Description
Use Case #	6
Use Case Name	Retrieve Modify Product Order Item Date List
Description	A request initiated by the Buyer to retrieve a list of Modify Product Order Item Dates that match the provided filter criteria.
Actors	Buyer, Seller
Pre-Conditions	<ol style="list-style-type: none"> 1. The Buyer must be authorized to perform the query.
Process Steps	<ol style="list-style-type: none"> 1. The Buyer submits a Retrieve Modify Product Order Item Date List request as shown in section including filter criteria the Seller should apply. 2. The Seller receives the request and validates the request. 3. The Seller determines if any Modify Product Order Item Date match the filter criteria in the request. 4. The Seller returns a list of summarized Modify Product Order Item Date instances as specified in section
Post-Conditions	<ol style="list-style-type: none"> 1. The Buyer receives a list of all Modify Product Order Item Requested Completion Date that match the Buyer's selection criteria. 2. The Buyer may initiate Use Case 10 to obtain detailed information for a specific Modify Product Order Item Completion Date Identifier.
Alternative Paths	<ol style="list-style-type: none"> 1. If errors are encountered, the Seller returns all identified errors in a reject response. 2. If the quantity of records exceeds a Seller's policy, the Seller must choose to respond with either:

	<ul style="list-style-type: none"> • an empty list and message that indicates the result set is too large and submit a new more specific query or • a response that indicates the result is too large and includes a subset of the matching Product Orders. <p>3. If the query does not find any matching records, then the Seller responds with an indication of this result.</p>
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Table 12 – Retrieve List of Modify Product Order Item Dates Use Case

Note: The maximum number of records to be returned will be determined by the Seller.

8.1.4.3 Retrieve Modify Product Order Item Completion Date by Identifier

The Retrieve Modify Product Order Item Completion Date by Identifier Use Case is detailed in this section.

Field	Description
Use Case #	7
Use Case Name	Retrieve Modify Product Order Item Date by Identifier
Description	A request initiated by the Buyer to retrieve the details of a Modify Product Order Item Date with the given Identifier. This includes all Modify Product Order Item Completion Date attributes.
Actors	Buyer, Seller
Pre-Conditions	<ol style="list-style-type: none"> 1. The Buyer knows the Modify Product Order Item Date Identifier they want to retrieve details on. 2. A Modify Product Order Item Completion Date Identifier exists in the Seller's system and the Modify Product Order Item Date is available for online retrieval. <p>Note: Any Modify Product Order Item Date submitted by the Buyer that exists in the Seller's system must be able to be retrieved via the API</p>
Process Steps	<ol style="list-style-type: none"> 1. The Buyer initiates a Retrieve Modify Product Order Date by Identifier request to the Seller using the Modify Product Order Item Completion Date Identifier. 2. The Seller responds to the Retrieve Modify Product Order Item Completion Date by Identifier request with the up-to-date view of the Modify Product Order Item Date.
Post-Conditions	<ol style="list-style-type: none"> 1. The Buyer has detailed information on the Modify Product Order Item Date with the given Modify Product Order Item Completion Date Identifier.

Alternative Paths	<ol style="list-style-type: none"> 1. If errors are encountered, the Seller returns all identified errors in a reject response and the Buyer may submit a new query. 2. If the Modify Product Order Item Date is not found, the Buyer must receive a response indicating this. 3. If the Buyer is not authorized to retrieve the Modify Product Order Item Date, the Buyer must receive a response indicating this. 4. If the Seller has archived a Modify Product Order Item Date after reaching a final state, the Seller may return an error because it is no longer possible to retrieve the Modify Product Order Item Date.
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Table 13 – Retrieve Modify Product Order Item Date by Identifier Use Case

Note: The timeframe that a Modify Product Order Item Date in the final state remains able to be retrieved is agreed to by the Buyer and Seller.

8.1.5 Cancel In-Flight Product Order

The following Use Cases are contained in this section:

- Cancel In-Flight Product Order Request
- Retrieve List of Cancel Requests
- Retrieve Cancel Request of In-Flight Product Order by Cancel Request ID

8.1.5.1 Cancel In-Flight Product Order Use Case

The Cancel In-Flight Order Use Case is detailed in this section.

Field	Description
Use Case #	8
Use Case Name	Cancel In-Flight Product Order Request
Description	A request initiated by the Buyer to cancel an In-Flight Product Order.
Actors	Buyer, Seller
Pre-Conditions	<ol style="list-style-type: none"> 1. An In-Flight Product Order exists in the Seller's system. 2. The Buyer can cancel the Product Order. Buyers may only cancel Product Orders that they initiated.
Process Steps	<ol style="list-style-type: none"> 1. The Buyer initiates a Cancel In-Flight Product Order Request. 2. The Seller validates the Cancel In-Flight Product Order Request. 3. Seller initiates the Cancel process, sets the Cancel Request state to ACKNOWLEDGED, assigns a Cancel In-Flight Product Order Identifier,

	<p>and changes the state of the referenced Product Order to ASSESSING_CANCELLATION.</p> <ol style="list-style-type: none"> The Seller notifies the Buyer of any charges resulting from cancelling the referenced Product Order while the Cancel Request is in the ACKNOWLEDGED state. (See Charge as described in section 8.1.6 for details on this). The Seller accepts the Cancel Request. The Cancel Request is set to ACCEPTED and the referenced Product Order state is set to CANCELLING. Once the Seller has completed the cancellation process, the state of the referenced Product Order is changed to CANCELLED.
Post-Conditions	<ol style="list-style-type: none"> The Product Order is cancelled.
Alternative Paths	<ol style="list-style-type: none"> The Seller returns an error message if an error is encountered while processing that prevents the Seller from completing the request. The Seller may determine that the In-Flight Product Order cannot be cancelled and may reject the request. The Seller sets the state of the Cancel Request to REJECTED and returns the referenced Product Order to IN_PROGRESS.

Table 14 – Cancel In-Flight Product Order Request Use Case

8.1.5.2 Retrieve Cancel In-Flight Product Order Request List

The Retrieve Cancel In-Flight Product Order Request List Use Case is detailed in this section.

Field	Description
Use Case #	9
Use Case Name	Retrieve List of Cancel In-Flight Product Order Request
Description	A request initiated by the Buyer to retrieve a list of Cancel Requests that match the provided filter criteria.
Actors	Buyer, Seller
Pre-Conditions	<ol style="list-style-type: none"> The Buyer must be authorized to perform the query.
Process Steps	<ol style="list-style-type: none"> The Buyer submits a Retrieve List of Cancel In-Flight Product Order request as shown in section 10.12.1 based on the filter criteria options. The Seller receives the request and validates the request. The Seller determines if there are any Cancel Requests that match the filter criteria in the request. The Seller returns a list of summarized cancel instances as specified in section 10.8.2

Post-Conditions	<ol style="list-style-type: none"> 1. The Buyer receives the appropriate response. 2. The Buyer may initiate Use Case 10 to obtain detailed information on a Seller Cancel Request Identifier.
Alternative Paths	<ol style="list-style-type: none"> 1. If errors are encountered, the Seller returns all identified errors in a reject response and the Buyer may submit a new query. 2. If the quantity of records exceeds a Seller's policy, the Seller must choose to respond with either: <ul style="list-style-type: none"> • an empty list and message that indicates the result set is too large and submit a new more specific query or • a response that indicates the result is too large and includes a subset of the matching Product Orders. 3. If the query does not find any matching records, then the Seller will respond with an indication of this result.

Table 15 – Retrieve List of Cancel In-Flight Product Order Requests Use Case

8.1.5.3 Retrieve Cancel In-Flight Product Order Request by Cancel Request Identifier

The Retrieve Cancel In-Flight Product Order Request by Cancel Request Identifier Use Case is detailed in this section.

Field	Description
Use Case #	10
Use Case Name	Retrieve Cancel In-Flight Product Order Request by Cancel Request ID
Description	A request initiated by the Buyer to retrieve a Cancel Request by Identifier
Actors	Buyer, Seller
Pre-Conditions	<ol style="list-style-type: none"> 1. The Buyer must be authorized to perform the query.
Process Steps	<ol style="list-style-type: none"> 1. The Buyer initiates a Retrieve Cancel In-Flight Product Order Request by Cancel Identifier request to the Seller using the Seller Cancel Request ID. 2. The Seller responds to the Retrieve Cancel In-Flight Product Order Request by Cancel Identifier request with the up-to-date view of the Cancel Request as specified in 10.13.2.
Post-Conditions	<ol style="list-style-type: none"> 1. The Buyer has detailed information on the specified Cancel Request Identifier.

Alternative Paths	<ol style="list-style-type: none"> 1. If errors are encountered, the Seller returns all identified errors in a reject response and the Buyer may submit a new query. 2. If the Seller Cancel Request Identifier is not found, the Buyer must receive a reject response. 3. If the Seller has archived a Cancel Request after reaching a final state, the Seller may return an error since the Cancel Request is no longer able to be retrieved.
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Table 16 – Retrieve Cancel In-Flight Product Order Request by Cancel Request Identifier Use Case

8.1.6 Charge

The following Use Cases are contained in this section:

- Initiate Charge
- Respond to Charge
- Retrieve List of Charges
- Retrieve Charge by Charge Identifier

8.1.6.1 Initiate Charge Use Case

The Initiate Charge Use Case is detailed in this section.

Field	Description
Use Case #	11
Use Case Name	Initiate Charge
Description	A process that is initiated by the Seller for a Product Order Item, Modify Product Order Item Completion Date, or Cancel Product Order. The Seller identifies one or more charges associated with the Product Order Item, Modify Product Order Item Completion Date, or Cancel Product Order.
Actors	Buyer, Seller
Pre-Conditions	A Product Order must be IN_PROGRESS state. A Modify Product Order Item Completion Date must be in ACKNOWLEDGED state. A Cancel Product Order must be in ACKNOWLEDGED state.

Table 17 – Initiate Charge Use Case

8.1.6.1.1 Charge for Product Order Use Case

The Initiate Charge Use Case when the Charge is associated with a Product Order is shown in this section.

Field	Description
Use Case #	11a
Use Case Name	Initiate Charge Associated to Product Order
Process Steps	<ol style="list-style-type: none"> 1. The Seller identifies one or more charges as specified in section 9.15 associated with a Product Order Item. A Charge is initiated by the Seller and a Charge notification is sent by the Seller. The referenced Product Order Item moves to the HELD state until a response is received from the Buyer or the request for information expires and a Product Order Item State Change notification is sent by the Seller. 2. The Buyer receives the Charge notification, Product Order Item State Change notification, or queries the Product Order by Product Order Identifier and receives any Charges associated with each Product Order Item contained within the Product Order. 3. The Buyer accepts each Charge Item contained within the Charge. 4. The Seller changes the state of the Charge to COMPLETE, updates the Product Order Item with the accepted charges and changes the referenced Product Order Item state to IN_PROGRESS.
Post-Conditions	The Buyer and Seller have agreed to the charges that will be accepted, that will be declined, and the Product Order state can be updated.
Alternative Paths	<ol style="list-style-type: none"> 1. The Buyer or Seller returns an error message if an error is encountered while processing that prevents the Buyer or Seller from completing the request. 2. If the Seller identifies additional charges for a Product Order Item, they withdraw the Charge and notify the Buyer of the Charge state change. A new Charge is initiated by the Seller including the updated charges. 3. If the Buyer rejects a Charge Identifier that is not identified as a Blocking charge, the Seller changes the state of the Charge to COMPLETE and changes the referenced Product Order Item state to IN_PROGRESS. 4. If the Buyer rejects a Charge Identifier that is identified as a Blocking charge, the Seller changes the state of the Charge to COMPLETE, changes the referenced Product Order Item state to FAILED, and changes any Product Order Items related to the referenced Product Order Item to FAILED.

Table 18 – Initiate Charge Use Case

8.1.6.1.2 Charge for Modify Product Order Item Completion Date Use Case

The Initiate Charge Use Case when the Charge is associated with a Product Order is shown in this section.

Field	Description
Use Case #	11b
Use Case Name	Initiate Charge Associated to Modify Product Order Item Completion Date
Process Steps	<ol style="list-style-type: none"> 1. The Seller identifies one or more charges as specified in section 9.15 associated with a Modify Product Order Item Completion Date. A Charge is initiated by the Seller and a Charge notification is sent by the Seller. The referenced Modify Product Order Item Completion Date moves to the ASSESSING_CHARGE state until a response is received from the Buyer or the request for information expires and a Modify Product Order Item Completion Date State Change notification is sent by the Seller. 2. The Buyer receives the Charge notification, Modify Product Order Item Completion Date State Change notification, or queries the Modify Product Order Item Completion Date by Modify Product Order Item Completion Date Identifier and receives any Charges associated with Modify Product Order Item Completion Date. 3. The Buyer accepts each Charge Item contained within the Charge. 4. The Seller changes the state of the Charge to COMPLETE, updates the Modify Product Order Item Completion Date with the accepted charges and changes the referenced Modify Product Order Item Completion Date state to COMPLETED.
Post-Conditions	The Buyer and Seller have agreed to the charges that will be accepted, that will be declined, and the Modify Product Order Item Completion Date state can be updated.
Alternative Paths	<ol style="list-style-type: none"> 1. The Buyer or Seller returns an error message if an error is encountered while processing that prevents the Buyer or Seller from completing the request. 2. If the Seller identifies additional charges for a Modify Product Order Item Completion Date, they withdraw the Charge and notify the Buyer of the Charge state change. A new Charge is initiated by the Seller including the updated charges. 3. If the Buyer rejects a Charge Identifier that is identified as a Blocking charge, the Seller changes the state of the Charge to COMPLETE and changes the referenced Modify Product Order Item Completion Date state to DECLINED.

Table 19 – Initiate Charge Use Case Associated with Modify Product Order Item Completion Date

8.1.6.1.3 Charge for Modify Product Order Item Completion Date Use Case

The Initiate Charge Use Case when the Charge is associated with a Product Order is shown in this section.

Field	Description
Use Case #	11c

Use Case Name	Initiate Charge Associated to Cancel Product Order
Process Steps	<ol style="list-style-type: none"> 1. The Seller identifies one or more charges as specified in section 9.15 associated with a Cancel Product Order. A Charge is initiated by the Seller and a Charge notification is sent by the Seller. The referenced Cancel Product Order moves to the ASSESSING_CHARGE state until a response is received from the Buyer or the request for information expires and a Cancel Product Order notification is sent by the Seller. 2. The Buyer receives the Charge notification, Cancel Product Order State Change notification, or queries the Cancel Product Order by Cancel Product Order Identifier and receives any Charges associated with Cancel Product Order. 3. The Buyer accepts each Charge Item contained within the Charge. 4. The Seller changes the state of the Charge to COMPLETE, cancels the Product Order, and changes the referenced Cancel Product Order state to COMPLETED.
Post-Conditions	The Buyer and Seller have agreed to the charges that will be accepted, that will be declined, and the Modify Product Order Item Completion Date state can be updated.
Alternative Paths	<ol style="list-style-type: none"> 1. The Buyer or Seller returns an error message if an error is encountered while processing that prevents the Buyer or Seller from completing the request. 2. If the Seller identifies additional charges for a Cancel Product Order, they withdraw the Charge and notify the Buyer of the Charge state change. A new Charge is initiated by the Seller including the updated charges. 3. If the Buyer rejects a Charge Identifier that is identified as a Blocking charge, the Seller changes the state of the Charge to COMPLETE and changes the referenced Cancel Product Order state to DECLINED, and returns the Product Order to IN_PROGRESS.

Table 20 – Initiate Charge Use Case Associated with Cancel Product Order

8.1.6.2 Respond to Charge Use Case

The Respond to Charge Use Case is detailed in this section.

Field	Description
Use Case #	12
Use Case Name	Respond to Charge
Description	A process that is initiated by the Buyer in response to a Charge being initiated by the Seller. The Buyer may respond with either an ACCEPT or REJECT for each charge.
Actors	Buyer, Seller

Pre-Conditions	A Charge
Process Steps	<ol style="list-style-type: none"> 1. The Buyer responds to the Charge with either an ACCEPTED or REJECTED for each and every Charge Item included in the Charge. 2. If the Buyer accepts the charges, the Seller changes the state of the Charge to COMPLETE, updates the Product Order Item with the accepted charges, and changes the referenced Product Order Item state to IN_PROGRESS.
Post-Conditions	The Buyer and Seller have agreed to the charges that will be accepted, that will be declined, and the Product Order state can be updated.
Alternative Paths	<ol style="list-style-type: none"> 1. The Seller returns an error message if an error is encountered while processing that prevents the Buyer or Seller from completing the request. 2. If the Buyer rejects a Charge Identifier that is not identified as a Blocking charge, the Seller changes the state of the Charge to COMPLETE and changes the referenced Product Order Item state to IN_PROGRESS. 3. If the Buyer rejects a Charge Identifier that is identified as a Blocking charge, the Seller changes the state of the Charge to COMPLETE, changes the referenced Product Order Item state to FAILED, and changes any Product Order Items related to the referenced Product Order Item to FAILED. If the Buyer rejects a Blocking charge, the Seller may refuse to complete the delivery of the Product Order Item related to the Blocking charge and may assess additional charges that are not included in the Charge. This may or may not impact other Product Order Items associated to the Product Order. 4. If they Buyer rejects a Blocking charge but accepts additional charges related to the Product Order Item, the Seller returns an error.

Table 21 – Respond to Charge Use Case

8.1.6.2.1 Respond to Charge Associated to Product Order Item Use Case

The Respond to Charge Associated to Product Order Item Use Case is detailed in this section.

Field	Description
Use Case #	12a
Use Case Name	Respond to Charge Associated to a Product Order Item
Process Steps	<ol style="list-style-type: none"> 1. The Buyer responds to the Charge with either an ACCEPTED or REJECTED for each and every Charge Item included in the Charge. 2. If the Buyer accepts the charges, the Seller changes the state of the Charge to COMPLETE, updates the Product Order Item with the accepted charges, modifies the Product Order Item Completion Date and Expedite Indicator as appropriate, and changes the referenced Product Order Item state to IN_PROGRESS.

Post-Conditions	The Buyer and Seller have agreed to the charges that will be accepted, that will be declined, and the Product Order state can be updated.
Alternative Paths	<ol style="list-style-type: none"> 1. The Seller returns an error message if an error is encountered while processing that prevents the Buyer or Seller from completing the request. 2. If the Buyer rejects a Charge Identifier that is not identified as a Blocking charge, the Seller changes the state of the Charge to COMPLETE and changes the referenced Product Order Item state to IN_PROGRESS. 3. If the Buyer rejects a Charge Identifier that is identified as a Blocking charge, the Seller changes the state of the Charge to COMPLETE, changes the referenced Product Order Item state to FAILED, and changes any Product Order Items related to the referenced Product Order Item to FAILED. If the Buyer rejects a Blocking charge, the Seller may refuse to complete the delivery of the Product Order Item related to the Blocking charge and may assess additional charges that are not included in the Charge. This may or may not impact other Product Order Items associated to the Product Order. 4. If they Buyer rejects a Blocking charge but accepts additional charges related to the Product Order Item, the Seller returns an error.

Table 22 – Respond to Charge Associated to Product Order Item Use Case

8.1.6.2.2 Respond to Charge Associated to Modify Product Order Item Completion Date Use Case

The Respond to Charge Associated to Modify Product Order Item Completion Date Use Case is detailed in this section.

Field	Description
Use Case #	12b
Use Case Name	Respond to Charge Associated to a Modify Product Order Item Completion Date
Process Steps	<ol style="list-style-type: none"> 1. The Buyer responds to the Charge with either an ACCEPTED or REJECTED for each and every Charge Item included in the Charge. 2. If the Buyer accepts the charges, the Seller changes the state of the Charge to COMPLETE, and changes the referenced Modify Product Order Item Completion Date state to COMPLETED.
Post-Conditions	The Buyer and Seller have agreed to the charges that will be accepted, that will be declined, and the Modify Product Order Item Completion Date state can be updated.
Alternative Paths	<ol style="list-style-type: none"> 1. The Seller returns an error message if an error is encountered while processing that prevents the Buyer or Seller from completing the request. 2. If the Buyer rejects a Charge Identifier that is identified as a Blocking charge, the Seller changes the state of the Charge to COMPLETE, changes the referenced Modify Product Order Item Completion Date state to DECLINED. No modification to the Product Order Item is performed.

Table 23 – Respond to Charge Associated to Modify Product Order Item Completion Date Use Case

8.1.6.2.3 Respond to Charge Associated to Modify Product Order Item Completion Date Use Case

The Respond to Charge Associated to Modify Product Order Item Completion Date Use Case is detailed in this section.

Field	Description
Use Case #	12c
Use Case Name	Respond to Charge Associated to a Cancel Product Order
Process Steps	<ol style="list-style-type: none"> 1. The Buyer responds to the Charge with either an ACCEPTED or REJECTED for each and every Charge Item included in the Charge. 2. If the Buyer accepts the charges, the Seller changes the state of the Charge to COMPLETE, changes the referenced Cancel Product Order state to COMPLETED, and cancels the Product Order.
Post-Conditions	The Buyer and Seller have agreed to the charges that will be accepted, that will be declined, and the Cancel Product Order state can be updated.
Alternative Paths	<ol style="list-style-type: none"> 1. The Seller returns an error message if an error is encountered while processing that prevents the Buyer or Seller from completing the request. 2. If the Buyer rejects a Charge Identifier that is identified as a Blocking charge, the Seller changes the state of the Charge to COMPLETE, changes the referenced Cancel Product Order state to DECLINED. The Product Order is not cancelled.

Table 24 – Respond to Charge Associated to Cancel Product Order Use Case

8.1.6.3 Retrieve List of Charges Use Case

The Retrieve List of Charges Use Case is detailed in this section.

Field	Description
Use Case #	13
Use Case Name	Retrieve List of Charges
Description	A request initiated by the Buyer to retrieve a list of Charges that match the provided filter criteria.
Actors	Buyer, Seller

Pre-Conditions	1. The Buyer must be authorized to perform the query.
Process Steps	<ol style="list-style-type: none"> 1. The Buyer submits a Retrieve List of Charges request as shown in section 10.14.1 based on the filter criteria options. 2. The Seller receives the request and validates the request. 3. The Seller determines if there are any Charges that match the filter criteria in the request. 4. The Seller returns a list of summarized Charge instances as specified in section 10.14.2.
Post-Conditions	<ol style="list-style-type: none"> 1. The Buyer receives the appropriate response. 2. The Buyer may initiate Use Case 13 to obtain detailed information on a Charge Identifier.
Alternative Paths	<ol style="list-style-type: none"> 1. If errors are encountered, the Seller returns all identified errors in a reject response and the Buyer may submit a new query. 2. If the quantity of records exceeds a Seller's policy, the Seller must choose to respond with either: <ul style="list-style-type: none"> • an empty list and message that indicates the result set is too large and submit a new more specific query or • a response that indicates the result is too large and includes a subset of the matching Charges. 3. If the query does not find any matching records, then the Seller will respond with an indication of this result.

Table 25 – Retrieve List of Charges Use Case

8.1.6.4 Retrieve Charge by Charge Identifier Use Case

The Retrieve Charge by Charge Identifier Use Case is detailed in this section.

Field	Description
Use Case #	14
Use Case Name	Retrieve Charge by Charge Identifier
Description	A request initiated by the Buyer to request a Charge by Identifier
Actors	Buyer, Seller
Pre-Conditions	1. The Buyer must be authorized to perform the query.
Process Steps	1. The Buyer initiates a Query Charge Identifier Request to the Seller using the Seller Charge Identifier.

	2. The Seller responds to the Query Charge Identifier Request with the latest view of the Charge as shown in Table 47.
Post-Conditions	1. The Buyer has detailed information on the specified Seller Charge Identifier.
Alternative Paths	1. If errors are encountered, the Seller returns all identified errors in a reject response and the Buyer may submit a new query. 2. If the Seller Charge Identifier is not found, the Buyer must receive a reject response.

Table 26 – Retrieve Charge by Charge Identifier Use Case

8.1.7 Notification Use Cases

The following Use Cases are contained in this section:

- Register for Notifications
- Send Notification

8.1.7.1 Register for Notifications Use Case

The Register for Notifications Use Case is detailed within this section.

Field	Description
Use Case #	15
Use Case Name	Register for Notifications
Description	A request initiated by the Buyer to instruct the Seller to send notifications when any of the following occur: <ul style="list-style-type: none"> • Product Order state change • Modify Product Order Item Completion Date state change • Cancel In-Flight Product Order Request state change • Charge state change • When a milestone is reached • When a Charge is initiated.
Actors	Buyer, Seller
Pre-Conditions	The Seller supports notifications.
Process Steps	1. The Buyer sends the Register for Notifications request as shown in section 10.16.1 to the Seller specifying where to send notifications and which Notification Types to include in notifications. 2. The Seller receives the Register for Notifications Request.

	<ol style="list-style-type: none"> 3. The Seller records which notifications to send, where to send such notifications for this Buyer. 4. The Seller returns an acknowledgement to the Buyer as shown in section 10.16.2
Post-Conditions	The Seller is aware of where to send notifications of state changes or when specific milestones are reached as described in Use Case 9 in Table 28.
Alternative Paths	The Seller returns an error message if an error is encountered while processing that prevents the Seller from completing the request.

Table 27 – Register for Notifications Use Case

8.1.7.2 Send Notification Use Case

The Send Notification Use Case is detailed in this section.

Field	Description
Use Case #	16
Use Case Name	Send Notification
Description	<p>A notification initiated by the Seller to the Buyer providing subsequent status information when any of the follow occurs:</p> <ul style="list-style-type: none"> • Product Order state change • Modify Product Order Item Completion Date state change • Cancel In-Flight Product Order Request state change • Charge state change • When a milestone is reached • When a Charge is initiated
Actors	Buyer, Seller
Pre-Conditions	<ol style="list-style-type: none"> 1. The Seller supports notifications. 2. The Buyer has subscribed to Notifications. 3. An In-Flight Product Order exists in the Seller's system, and the Seller has initiated the validation process.
Process Steps	<ol style="list-style-type: none"> 1. The Seller sends the notifications to the location(s) registered by the Buyer as shown in section 10.17.
Post-Conditions	<ol style="list-style-type: none"> 1. The Seller has sent related notification.

Alternative Paths	
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Table 28 – Send Notification Use Case

If the Buyer endpoint is unreachable an error is returned to the Seller. The Seller may, at the Seller's discretion, continue to try to send notifications to the endpoint or may mark that endpoint as failed and stop sending notifications to that endpoint.

8.2 Seller and Buyer Interaction for Non-Recurring or Updated Recurring Charges

Within the Product Order process (Create Product Order , Cancel In-flight Product Order, and in the Seller's response to the Buyer's request) interactions between the Buyer and Seller may be required. This section explains these interactions.

8.2.1 Charge

When new non-recurring or changes on recurring charges are identified by the Seller during their processing of a Product Order, the Seller must communicate these new or modified charges to the Buyer and the Buyer must respond to the Seller informing the Seller if they accept or reject each charge. This is done using the Charge.

Within the Charge, the Seller indicates for each charge, if the charge is Blocking or non-Blocking. If the Buyer rejects a Blocking Charge, the Seller will cancel that Product Order Item and any related Product Order Items. If the Buyer rejects a non-Blocking Charge, the Seller may proceed with fulfillment of the Product Order Item.

A Charge is initiated for any new or updated charges. There are several rules related to the Charge. These are described below:

- A Charge contains one or more charges related to the same Product Order Item
- A Product Order Item cannot have more than one Charge active at the same time
- A separate Charge is initiated for each Product Order Item within a Product Order that has new or updated charges
- A Charge may be initiated while the related Product Order is in the IN-PROGRESS, ASSESSING_CANCELLATION, ASSESSING_CHARGE, or ASSESSING_MODIFY_DATE Product Order States. The Product Order Item is in the IN_PROGRESS, HELD, or PENDING state.

Each Charge has a unique Charge Identifier that is set by the Seller. The Charge Identifier is used by Buyer and Seller to refer to the specific Charge. A list of Charge Identifiers is included for each Product Order Item included in a Product Order. This list may be empty if no Charges are related to that Product Order Item.

8.2.2 Expedite Requested

The Buyer requests that a Product Order Item be expedited in a Create Product Order request or with a Modify Product Order Item Completion Date request by setting the Product Order Item Expedite Indicator attribute to TRUE.

The Seller determines if they will accept the expedite and what the charges are to expedite the Product Order Item. If the Seller accepts the expedite request, they include any Charge Identifiers associated with expediting the Product Order Item in the Product Order Item Charges attributes, indicating that the charges are for expediting the Product Order Item.

The Buyer reviews the Seller's Charge and if they accept the Seller's specified charges associated with expediting the Product Order Item, the Seller indicates that they will accept the expedite using the Product Order Item Expedite Accepted Indicator attribute.

the Seller places the Product Order Item in an HELD state while awaiting confirmation on acceptance from the Buyer.

8.2.3 Construction Charges

If during the Product Order process the Seller determines that there are Non-Recurring Charges associated with construction to provide a requested Product Order Item, the Seller communicates these charges to the Buyer using the Product Order Item Charges attributes, specifying that the Charge Type is Construction and the Charge Value.

The Buyer reviews the Seller's response and if they are in agreement with the Seller's specified charges associated with construction for the Product Order Item, they indicate this agreement by setting the Charge Acceptance Indicator to TRUE.

The Seller places the Product Order Item in a HELD state while awaiting confirmation on acceptance from the Buyer.

8.2.4 Connection Charges

If during the Product Order process the Seller determines that there are Non-Recurring Charges associated with the connection of a requested Product Order Item, the Seller communicates these charges to the Buyer using the Charge specifying that the Charge Type is Connection and the Charge Value.

The Buyer reviews the Seller's response and if they agree with the Seller's specified charges associated with construction for the Product Order Item, they indicate this agreement by setting the Charge Acceptance Indicator to TRUE.

The Seller places the Product Order Item in a HELD state while awaiting confirmation on acceptance from the Buyer.

9 Product Order Operation Attributes

This section identifies the attributes needed for each of the Product Order Management Use Cases defined previously. It is important to note that this section defines the superset of all MEF-defined attributes needed to support Product Order Management for the Use Cases defined in this document.

The columns in the tables are as follows:

Attribute	The name of the attribute
Description	A short description of the attribute
Type	Specified data type for the attribute such as string, integer, enumerations, durations, date/time, or reference to another entry in the table
Max Length	The maximum length of the attribute
Comments	Comments about the attribute

This section identifies the attributes needed for each of the Product Ordering Use Cases defined above.

It is important to note that this section defines the superset of all attributes needed to support Product Ordering for the Use Cases defined in this document. It is possible that individual Sellers may require additional attributes for their unique product offerings and the ability to extend the technical implementation of these requirements to allow for Buyer-Seller specific attributes should be accommodated but not mandated by the implementation design.

9.1 Buyer and Seller Attributes

Table 29 shows the Buyer and Seller attributes.

Attribute	Description	Type	Comments
Buyer	The unique name of the organization that is acting as the customer in this transaction.	String	See section 10.18 for rules on use of Buyer
Seller	The unique name of the organization that is acting as the supplier in this transaction.	String	See section 10.18 for rules on use of Seller
Seller Response Code	A response identifier, indicating if the Seller was able to successfully fulfill the request.	String	Set by the Seller

Table 29 – Buyer and Seller Attributes

[R1] The Seller Response Code **MUST** be included in all Seller responses.

9.2 Product Order Attributes

The attributes associated with the Create New Product Order Request (Use Case 1), Create Change Product Order Request (Use Case 2), Create Disconnect Product Order Request (Use Case 3), and Cancel In-Flight Product Order Request (Use Case 7) for a Product Order are shown in Table 30.

Attribute	Description	Type	Comments
Product Order Identifier	Unique identifier for the Product Order that is generated by the Seller when the Product Order is initially accepted via an API.	Identifier	Provided by the Seller
Product Order Version	The version of the Product Order Identifier	String	Set by the Seller.
Buyer Product Order Identifier	An identifier for this Product Order within the Buyer's enterprise.	Identifier	Assigned by Buyer. Retained by Seller
Product Order Create Date	Date when the Product Order was created in the Seller's system	dateTime	Set by the Seller
Project Identifier	An identifier that is used to group Product Orders that represent a unit of functionality that is important to a Buyer. A Project can be used to relate multiple Product Orders together.	Identifier	This value may be set by the Buyer to identify a project the Product Order is associated with. This is retained by the Seller.
Product Order Cancellation Date	Identifies the date the Seller cancelled the Product Order.	dateTime	Set by Seller when the Product Order is moved to the CANCELLED state.
Cancellation Reason	An optional free-form text field for the Seller to provide additional information regarding the reason for the cancellation.	String	Set by the Seller. If the Seller cancels the Product Order, the Seller provides the reason. If the Buyer requests the cancellation, the Seller copies the reason provided by the Buyer from the Cancel Request.
Note	Free form text to clarify or explain the Product Order	List of Note (Table 45)	
Product Order Item	Items contained in the Product Order.	List of Product Order Item (Table 32)	A Product Order contains at least one Product Order Item.

Attribute	Description	Type	Comments
Product Order State	The states as defined by TMF622 [11] and extended to meet MEF requirements. These states are used to convey the Product Order status during the lifecycle of the Product Order.	One of the following <ul style="list-style-type: none"> • ACKNOWLEDGED • ASSESSING_CANCELLATION • ASSESSING_CHARGE • ASSESSING_MODIFICATION • CANCELLED • CANCELLING • COMPLETE • FAILED • IN_PROGRESS • PARTIAL • REJECTED 	Set by the Seller
Product Order Final State Date	Identifies the date that all Product Order Items within the Product Order have reached a terminal state	dateTime	Set by Seller when all Product Order Items have reached a terminal state. No further action is permitted on the Product Order after this state is reached.
Product Order Contact Information	Identifies the name of the person or office that is responsible for the Product Order within the Buyer's organization.	Contact (Table 37)	
Seller Contact Information	Identifies the name of the person or office that is selling the product.	Contact (Table 37)	Set by Seller

Table 30 – Product Order Attributes

9.2.1 Updatable Product Order Attributes

The Product Order Attributes that can be updated as described in the Update Product Order Use Case are defined in Table 31.

Attribute	Description	Type	Comments
Buyer Product Order Identifier	An identifier for this Product Order within the Buyer's enterprise.	Identifier	Assigned by Buyer. Retained by Seller
Project Identifier	An identifier that is used to group Product Orders that represent a unit of functionality that is important to a Buyer. A Project can be used to relate multiple Product Orders together.	Identifier	This value may be set by the Buyer to identify a project the Product Order is associated with. This is retained by the Seller.
Note	Free form text to clarify or explain the Product Order	List of Note (Table 45)	
Product Order Contact Information	Identifies the name of the person or office that is responsible for the Product Order within the Buyer's organization.	Contact (Table 37)	
Order Item	Order Item attributes that may be updated	List of Product Order Item	See section 9.3.1 for the updateable Product Order Item attributes

Table 31 – Updatable Product Order Attributes

9.3 Product Order Item Attributes

Product Order Item attributes are shown in Table 32.

Attribute	Description	Type	Comments
Product Order Item Reference Identifier	A Buyer provided identifier to identify Product Order Items and to be able to relate them to one another.	Identifier	This is set by the Buyer and is unique within the Product Order.
Seller Product Order Item Identifier	A Seller provided identifier to identify the Product Order Items within a Product Order.	Identifier	This is only used when required for discussion between the Buyer and Seller.
Product Order Item Product Action	Action to be applied to this portion of the Product Order to the product referred by this Product Order Item	One of the following <ul style="list-style-type: none"> • INSTALL • CHANGE • DISCONNECT 	Set by the Buyer. Product refers to either a Product Specification or an existing Product as applicable
Product Order Item Product Identifier	The Buyer's existing Product for which the Product Order is being requested	Identifier	Set by the Buyer if the Product Action is CHANGE or DISCONNECT.
Product Order Item Product Offering Identifier	The Product Offering associated to the product for a new service.	Identifier	Set by the Buyer if the Product Action is INSTALL.
Product Order Item Product Specific Attributes	The technical attributes for the Product that would be delivered to fulfill this Product Order Item. This specifies the values for attributes defined in the Product Specification.		Set by the Buyer
Place Relationship	The relationships between this Product Order Item and one or more Places as defined in the Product Specification	List of Place Relationship (Table 44)	Set by the Buyer. Defined in the Product Specification
Product Order Item End Customer Name	The name of the End Customer, either a business name or an individual name	string	Set by the Buyer

Attribute	Description	Type	Comments
	depending on the end customer.		
Product Order Item Relationship	The relationship between Product Order Items in the Product Order	List of Product Order Item Relationships (Table 39)	
Product Order Item Coordinated Action	The interval after the completion of one or more related Product Order Items that this Product Order Item can be started or completed.	List of Product Order Item Coordinated Action (Table 40)	
Product Relationship	The relationship between a Product Order Item and one or more existing Products.	List of Product Relationship (Table 41)	
Product Order Item Note	A set of notes associated to the Product Order Item. This can be empty.	List of Note (Table 45)	
Product Order Item Requested Completion Date	Identifies the Buyer's desired due date (requested delivery date)	dateTime	Set by the Buyer.
Product Order Item Expedite Indicator	Indicates that expedited treatment is requested.	Boolean	Set by the Buyer. Default Value = FALSE. If this is set to TRUE, the Buyer sets the Requested Completion Date to the expedited date. See section 8.2 for a description of the interaction between the Buyer and Seller.
Product Order Item Expedite Accepted Indicator	Indicates if the Seller has accepted the Buyer's Expedite request.	Boolean	See section 8.2 for a description of the interaction between the Buyer and Seller. Set by the Seller. Default Value = FALSE.

Attribute	Description	Type	Comments
			If this is set to TRUE, the Seller provides the costs to expedite the Product Order in the Related Charges attribute.
Related Charges	The Charges associated to this Product Order Item	List of references to Charges (see Table 46)	See section 8.2 for a description of the interaction between the Buyer and Seller.
Product Order Item Telecommunication Service Priority/ Restoration Priority	Within the United States, indicates the provisioning and restoration priority as defined under the TSP Service Vendor Handbook.	String	Set by Buyer The valid values are defined in ATIS OBF document: ATIS-0404001
Buyer Product Order Item Contact	Identifies the name of the person or office that is buying the product.	Contact (Table 37)	
Buyer Implementation Contact	Identifies the name of the person or office that is the implementation contact for the Product Order Item.	Contact (Table 37)	
Buyer Technical Contact	Identifies the name of the person or office that is the technical contact for the Product Order Item.	Contact (Table 37)	
Product Order Item Failed Date	Identifies the date on which the Seller determined the Product Order Item could not be processed	dateTime	Set by Seller if Product Order Item State = FAILED. No further action is permitted on the Product Order Item after this notification.
Product Order Item Expected Completion Date	Identifies the date the Seller expects to complete the Product Order Item.	dateTime	Set by the Seller

Attribute	Description	Type	Comments
Product Order Item Completion Date	Identifies the date the Seller completed the Product Order Item.	dateTime	Set by the Seller when Product Order Item State = COMPLETED.
Product Order Item POQ Item	The POQ and POQ Item associated to this Product Order Item.	POQ Item Reference Attributes (see Table 50)	Set by the Buyer. The POQ attributes may be required by the Seller. In that case, this is a mandatory field. If the Seller does not require the POQ, then this is an optional attribute.
Product Order Item State	The state of the Product Order Item	One of <ul style="list-style-type: none"> • ACKNOWLEDGED • ASSESSING_CANCELATION • CANCELLED • CANCELLING • COMPLETED • FAILED • HELD • IN_PROGRESS • PENDING • REJECTED • UNASSESSED • VALIDATED 	Set by the Seller.
Product Order Item Quote Item	The Quote and Quote Item associated to this Product Order Item.	Quote Item Reference Attributes (Table 51)	Set by the Buyer. The Quote attributes may be required by the Seller. In that case, this is a mandatory field. If the Seller does not require the Quote,

Attribute	Description	Type	Comments
			then this is an optional attribute.
	Product Order		
Requested Product Order Item Term	Requested term of the Product Order Item	Term (Table 49)	Set by the Buyer
Product Order Item Term	Term of the Product Order Item	Term (Table 49)	Set by the Seller
Related Buyer Purchase Product Order Number	Identifies the Buyer Purchase Product Order Number that is related to this Product Order.	String	Set by the Buyer and retained by the Seller.
Buyer Billing Information	Buyer billing information	Buyer Billing (Table 38)	

Table 32 – Product Order Item Attributes

Note: Examples of Product Order Item Reference Identifier could be 1, 2, 3 or A, B, C. The Product Order Item Reference Identifier can be reused in multiple Product Orders to identify a Product Order Item within that Product Order.

9.3.1 Updatable Product Order Item Attributes

Product Order Item attributes that can be updated by the Buyer are shown in Table 33.

Attribute	Description	Type	Comments
Product Order Item End Customer Name	The name of the End Customer, either a business name or an individual name depending on the end customer.	string	Set by the Buyer
Product Order Item Note	A set of unstructured notes associated to the Product Order Item. This can be empty.	List of Note (Table 45)	
Buyer Product Order Item Contact	Identifies the name of the person or office that is buying the product.	Contact (Table 37)	
Buyer Implementation Contact	Identifies the name of the person or office that is the implementation	Contact (Table 37)	

Attribute	Description	Type	Comments
	contact for the Product Order Item.		
Buyer Technical Contact	Identifies the name of the person or office that is the technical contact for the Product Order Item.	Contact (Table 37)	
Related Buyer Purchase Product Order Number	Identifies the Buyer Purchase Product Order Number that is related to this Product Order.	String	Set by the Buyer and retained by the Seller.

Table 33 – Updatable Product Order Item Attributes

9.3.2 Non-Updatable Product Order Item Attributes

The Product Order Item attributes that cannot be updated once the Create Product Order request has been sent by the Buyer to the Seller are shown in Table 34. To modify these attributes, the Buyer cancels the Product Order and submits a new Create Product Order request with the correct attributes.

Attribute	Description	Type	Comments
Product Order Item Product Specific Attributes	The technical attributes for the Product that would be delivered to fulfill this Product Order Item. This specifies the values for attributes defined in the Product Specification.		Set by the Buyer
Place Relationship	The relationships between this Product Order Item and one or more Places as defined in the Product Specification	List of Place Relationship (Table 44)	Set by the Buyer. Defined in the Product Specification

Table 34 – Non-Updatable Product Order Item Attributes

9.4 Modify Product Item Date Request Attributes

The Modify Product Item Date Request attributes are detailed in Table 35.

Attribute	Description	Type	Comments
Modify Product Order Item Completion Date Identifier	Unique identifier for the Expedite Product Order Item that is generated by the Seller when the Expedite Product Order Item request is moved to the ACKNOWLEDGED state.	Identifier	Set by the Seller
Product Order Identifier	Unique identifier for the Product Order that is generated by the Seller when the Product Order is initially accepted via an API.	Identifier	Provided by Buyer in the request
Product Order Item Reference Identifier	A Buyer provided identifier to identify Product Order Items and to be able to relate them to one another.	Identifier	This is set by the Buyer and is unique within the Product Order.
Product Order Item Expedite Indicator	Indicates that expedited treatment is requested.	Boolean	Set by the Buyer. Default Value = FALSE. If this is set to TRUE, the Buyer sets the Requested Completion Date to the expedited date. .
Product Order Item Requested Completion Date	Identifies the Buyer's desired due date (requested delivery date)	dateTime	Set by the Buyer.
Modify Product Order Item Completion Date State	The state of the Expedite Product Order Item	One of: <ul style="list-style-type: none"> • ACKNOWLEDGED • ACCEPTED • ASSESSING_CHARGE • DECLINED • REJECTED 	Set by the Seller

Table 35 – Modify Product Order Item Date Attributes

9.5 Cancel Product Order Request Attributes

The Cancel Product Order Request attributes are detailed in Table 36.

Attribute	Description	Type	Comments
Seller Cancel Product Order Identifier	Unique identifier for the Cancel Product Order that is generated by the Seller when the Cancel Product Order request is accepted via an API	Identifier	Provided by the Seller
Product Order Identifier	Unique identifier for the Product Order that is generated by the Seller when the Product Order is initially accepted via an API.	Identifier	Value is set by the Buyer using Seller specified Product Order Identifier that is to be cancelled.
Product Order Version	The version of the Product Order Identifier	String	Value is set by the Buyer using Seller specified Product Order Version of the Product Order that is to be cancelled.
Note	Free form text to clarify or explain the Product Order Cancellation	List of Note (Table 45)	
Cancel Product Order State	The states as defined by TMF622 [11] and extended to meet MEF requirements. These states are used to convey the Cancel Product Order status during the lifecycle of the Product Order.	One of the following <ul style="list-style-type: none"> ACCEPTED ACKNOWLEDGED REJECTED 	Set by the Seller
Cancel Product Order Contact	Identifies the name of the person or office that is responsible for the Cancel Request within the Buyer's organization.	Reference to Contact (Table 37)	
Seller Contact	Identifies the name of the person or office that is selling the product.	Reference to Contact (Table 37)	Set by Seller
Cancellation Reason Type	Identifies the type of reason, Technical or	One of : <ul style="list-style-type: none"> TECHNICAL 	Set by the Buyer

Attribute	Description	Type	Comments
	Commercial, for the Cancellation Request	• COMMERCIAL	
Cancellation Reason	An optional attribute that allows the Buyer to provide additional detail to the Seller on their reason for cancelling the Product Order	String	Set by the Buyer.

Table 36 – Cancel Product Order Attributes

9.6 Contact Attributes

Table 37 contains the Contact attributes.

Attribute	Description	Type	Comments
Contact Name	Identifies the name of the person or office that is the Contact.	String	
Contact Telephone Number	Identifies the telephone number (excluding extension) of the Contact.	String	
Contact Telephone Number Extension	Identifies the telephone number extension of the Contact	String	
Contact Email Address	Identifies the Email address of the Contact when a profile does not already exist.	String	
Contact Postal Address	Identifies the postal address of the person or office to be contacted.	Postal address that includes all attributes of the Fielded Address (see MEF 79 [8] section 8.9.2)	
Contact Organization	The organization or company that the contact belongs to	String	

Table 37 – Contact Attributes

The following requirements apply whenever a Contact, either Seller or Buyer, is specified.

[R2] A Contact **MUST** include the following attributes defined in Table 37:

- Contact Name
- Contact Phone Number
- Contact Email Address

[O1] A Contact **MAY** contain the following attributes as specified in Table 37:

- Contact Telephone Number Extension
- Contact Postal Address
- Contact Organization

9.7 Buyer Billing Attributes

The below table defines the attributes associated with the Buyer Billing information. This information is provided per Product Order Item. The Seller may require that the Buyer Billing information be the same for each Product Order Item in a Product Order.

Attribute	Description	Type	Comments
Billing Account	Identifies the billing account to which the recurring and non-recurring charges for this request will be billed.	String	Required if the Buyer has more than one Billing Account with the Seller and for all new Product Orders.
Billing Contact	The Buyer contact for Billing.	Contact (Table 37)	
Agreement Name	The name of the Agreement which is referenced for the Product Order Item.	String	

Table 38 – Buyer Billing Attributes

9.8 Product Order Item Relationship Attributes

Table 39 shows Product Order Item Relationship attributes.

Attribute	Description	Type	Comments
Identifier Related Product Order Item Reference Identifier	Product Order Item Reference Identifier of the related Product Order Item (must be in the same Product Order).	String	Set by the Buyer

Product Order Item Relationship Nature	Specifies the nature of the relationship to the related Product Order Items.	String that is one of the relationship types specified in the Product Specification.	Set by the Buyer
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Table 39 – Product Order Item Relationship Attributes

Note: The nature of required relationships varies for Products of different types. For example, a UNI or ENNI Product may not have any relationships, but an Access E-Line may have two mandatory relationships (related to the UNI on one end and the ENNI on the other). More complex Products such as multipoint IP or Firewall Products may have more complex relationships. As a result, the allowed and mandatory Relationship Nature values are defined in the Product Specification.

9.9 Product Order Item Coordinated Action

Table 40 shows Coordinated Action attributes.

Attribute	Description	Type	Comments
Product Order Item Reference Identifier	Specifies one or more Product Order Items that are to be coordinated with this Product Order Item.	List of Product Order Item Reference Identifiers	Set by the Buyer
Product Order Item Coordination Dependency	A dependency between the Product Order Item and a related Product Order Item	One of: <ul style="list-style-type: none"> START_TO_START START_TO_FINISH FINISH_TO_START FINISH_TO_FINISH 	Set by the Buyer to define the type of Coordination Dependency.
Coordinated Action Delay	The period of time for which the coordinated action is delayed.	Duration	Set by Buyer

Table 40 – Product Order Item Coordination Action Attributes

There are four choices for the Product Order Item Coordination Dependency attribute. A short description of each of these is provided.

START_TO_START – Work on the specified Product Order Item begins at the same time as the related Product Order Items.

START_TO_FINISH – Work on the specified Product Order Item begins upon the completion of the related Product Order Items.

FINISH_TO_START – Work on the related Product Order Items begins after the completion of the specified Product Order Item.

9.10 Product Relationship Attributes

Table 41 shows Product Relationship attributes.

Attribute	Description	Type	Comments
Related Product Identifier	A list of one or more IDs of the related Products in the Product Inventory.	List of Product IDs	Set by the Buyer
Product Relationship Nature	Specifies the nature of relationship to the related Product. The nature of required relationships vary for Products of different types.	String that is one of the relationship types specified in the Product Specification.	Set by the Buyer

Table 41 – Product Relationship Attributes

Note: The nature of required relationships varies for Products of different types. For example, a UNI or ENNI Product may not have any relationships, but an Access E-Line may have two mandatory relationships (related to the UNI on one end and the ENNI on the other). More complex Products such as multipoint IP or Firewall Products may have more complex relationships. As a result, the allowed and mandatory Relationship Nature values are defined in the Product Specification.

9.11 Notification Registration Attributes

Table 42 shows the Notification Registration attributes.

Attribute	Description	Type	Comments
Return Address Information	The detailed information on the mechanism and address specifying where the Seller is to send any Product Order Notifications. There can be multiple locations for one Buyer.		For Further Study
List of Notification Types	The types of notifications that the Buyer wishes to receive.	List of one or more of: <ul style="list-style-type: none"> • CANCEL_STATE_CHANGE • CHARGE_CREATE • CHARGE_STATE_CHANGE • CHARGE_TIMEOUT • MODIFY_PRODUCT_ORDER_ITEM__DATE_STATE_CHANGE • PRODUCT_ORDER_EXPECTED_COMPLETION_DATE_SET • PRODUCT ORDER_ITEM_EXPECTED_COMPLETION_DATE_SET • PRODUCT ORDER_STATE_CHANGE • PRODUCT ORDER_ITEM_STATE CHANGE • PRODUCT_SPECIFIC_PRODUCT_ORDER_MILESTONE • PRODUCT_SPECIFIC_PRODUCT_ORDER_ITEM_MILESTONE 	
Action	Specification to Start Notifications or Stop Notifications.	One of: <ul style="list-style-type: none"> • START • STOP 	

Table 42 – Register for Notifications Buyer Attributes

9.12 Notification Attributes

Table 43 shows Notification attributes.

Attribute	Description	Type	Comments
Seller Object Identifier	Unique identifier that is generated by the Seller when the Seller Object Identifier Type is initially accepted or created via an API.	Identifier	Set by the Seller
Item Reference Identifier	A Buyer provided identifier to identify an Item and to be able to relate Items to one another.	Identifier	Provided by Seller. This is by the Buyer and is unique within the Product Order.
Seller Object Identifier Type	The type of Seller Object Identifier.	One of: <ul style="list-style-type: none"> • PRODUCT ORDER • CANCEL • CHARGE_PROCESS • MODIFY_PRODUCT_ORDER_ITEM_ 	Set by the Seller
Notification Types	The type of notifications	One of <ul style="list-style-type: none"> • CANCEL_STATE_CHANGE • CHARGE_CREATE • CHARGE_STATE_CHANGE • CHARGE_TIMEOUT • MODIFY_PRODUCT_ORDER_ITEM_ • _DATE_STATE_CHANGE • PRODUCT_ORDER_EXPECTED_COMPLETION_DATE_SET • PRODUCT ORDER_ITEM_EXPECTED_COMPLETION_DATE_SET • PRODUCT ORDER_STATE_CHANGE • PRODUCT ORDER_ITEM_STATE CHANGE 	

		<ul style="list-style-type: none"> PRODUCT_SPECIFIC_PRODUCT_ORDER_MILESTONE PRODUCT_SPECIFIC_PRODUCT_ORDER_ITEM_MILESTONE 	
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Table 43 – Seller Notification Attributes

9.13 Place Relationship Attributes

Table 44 shows Place Relationship Attributes.

Attribute	Description	Type	Comments
Role	The role of the place as specified in the Product Specification	String	Set by the Buyer as defined by the Seller in the Product Specification
Product Order Item Location Type	The attribute used to describe the location at which this Product Order Item is installed or is to be installed if needed per the Product Specification.	String that is one of: <ul style="list-style-type: none"> SERVICE_SITE FIELDED_ADDRESS FORMATTED_ADDRESS GEOGRAPHIC_POINT GEOGRAPHIC_ADDRESS_LABEL 	The Buyer is encouraged to use the Seller's SERVICE_SITE as the Product Order Item Location Type if one exists. If one does not exist, then the Buyer may use any other Quote Item Location Type. MEF 79.0.2 [9] Appendix A contains a description of the Address Validation process.
Product Order Item Location	The detailed location at which this Product Order Item is installed or is to be installed if this Product Order Item is to be installed at a particular location.	Reference to one of the below: <ul style="list-style-type: none"> Service Site (see MEF 79 [8] section 8.10) Fielded Address (see MEF 79 [8] section 8.9.2) Formatted Address (see MEF 	

		79 [8] section 8.9.3) <ul style="list-style-type: none"> • Global Address Label (see MEF 79 [8] section 8.9.4 and MEF 79.0.2 [9]) • Geographic Point (see MEF 79 [8] section 8.9.6 and MEF 79.0.2 [9]) 	
Product Order Item Service Site Contact	The person to contact to get access to this Service Site	Contact (Table 37)	Set by the Buyer. The term Service Site is used to refer to the end point of the Product. A Service Site Identifier may not have been assigned at the time the Buyer submits the request.”

Table 44 – Place Relationship Attributes

Note: The Service Site is identified only by the Service Site Identifier. Other Location types may be identified by value or identifier.

9.14 Note Attributes

Table 45 shows Note attributes.

Attribute	Description	Type	Comments
Note Date	The date of the note.	dateTime	Set by the Buyer or Seller. The Buyer creates a note when requesting the quote. The Seller may add notes.
Note Author	The author of the note.	String	

Attribute	Description	Type	Comments
Note Source	Indicates if the note is from Buyer or Seller	One of: <ul style="list-style-type: none"> BUYER SELLER 	Set by the Buyer or Seller
Note Text	The text of the note.	String	

Table 45 – Note Attributes

9.15 Charge Attributes

Table 46 Shows the Charge Attributes

Attribute	Description	Type	Comments
Charge Identifier	A unique identifier of the Charge	Identifier	Set by the Seller
Charge Creation Date	Date that the Charge was created by the Seller.	dateTime	Set by the Seller
Product Order Identifier	Unique identifier for the Product Order that is generated by the Seller when the Product Order is initially accepted via an API.	Identifier	Provided by the Seller
Product Order Item Reference Number	The Product Order Item Reference Number for the Product Order Item that the Charge is related to.	String	This is set by the Buyer and is matches the Product Order Item Reference Number in the Product Order Request
Charge Items	A list of Charge Identifiers associated with the Charge	List of Charge Items (Table 47)	Set by the Seller
Response Due Date	The date that the Buyer must respond to the Seller's Charge. If there is no response received by the Response Due Date the Seller the Seller will treat all charges as declined.	dateTime	Set by the Seller

Attribute	Description	Type	Comments
Charge State	The state of the Charge	One of the following: <ul style="list-style-type: none">• AWAITING_RESPONSE• COMPLETED• WITHDRAWN_BY_SELLER	State is set by the Seller

Table 46 – Charge Attributes

9.16 Charge Item Attributes

Table 47 shows the Charge Item attributes.

Attribute	Description	Type	Comments
Charge Item Identifier	An identifier that is unique among all Charges associated to a Product Order Item	Identifier	Set by the Seller
Charge Type	The type of charge.	One of the following: <ul style="list-style-type: none"> • RECURRING • NON_RECURRING • USAGE_BASED 	Set by the Seller.
Charge Description	A description of the charge	One of: <ul style="list-style-type: none"> • EXPEDITE • CONSTRUCTION • CONNECTION • IN-FLIGHT CANCELLATION • DISCONNECT 	Set by Seller
Charge Activity Type	Indicates if this is a new charge or a change to a charge provided in a Quote.	One of: <ul style="list-style-type: none"> • NEW • CHANGE 	Set by the Seller
Recurring Charge Period	Used for a recurring Charge with a Charge Type = RECURRING to indicate the period	One of <ul style="list-style-type: none"> • HOUR • DAY • WEEK • MONTH • YEAR 	Set by the Seller
Charge Item Price Unit Of Measure	Unit of Measure (Gb, SMS volume, etc.) if Charge Item Charge Type = USAGE_BASED	String	Set by the Seller if Charge Item Charge Type = USAGE_BASED
Blocking	Indicates if rejecting the charge will cause the Seller to cancel the Product Order Item, or close the Cancel Product Order or Modify Product	Boolean	Set by the Seller

Attribute	Description	Type	Comments
	Order Item Completion Date without action.		
Charge Price	The value associated with the charge	Price (Table 48)	Set by the Seller
Charge Acceptance Indicator	Indicates if the Buyer has accepted the specified charge	One of the following: <ul style="list-style-type: none"> ACCEPTED DECLINED 	Set by the Buyer.
Charge Item State	The state of the Charge Item	<ul style="list-style-type: none"> AWAITING_RESPONSE ACCEPTED_BY_BUYER DECLINED_BY_BUYER WITHDRAWN_BY_SELLER 	

Table 47 – Charge Item Attributes

9.17 Price Attributes

Table 48 shows the Price attributes.

Attribute	Description	Type	Comments
Price Tax Rate	The tax rate applied.		This is an optional attribute set by the Seller
Price Tax Included Amount	All taxes included amount (expressed in the given currency).	Money <ul style="list-style-type: none"> Currency Value 	This is an optional attribute set by the Seller
Price Duty Free Amount	All taxes excluded amount (expressed in the given currency).	Money <ul style="list-style-type: none"> Currency Value 	

Table 48 – Price Attributes

9.18 Term Attributes

Table 49 shows the Term attributes.

Attribute	Description	Type	Comments
Product Order Item Term Duration	Duration of the term	Duration	Set by the Buyer. If not set by the Buyer, this is set by the Seller.
Seller End of Term Action	The action the Seller will take once the term expires. Applicable actions are defined in Product Offering.	Indicator with following allowed values: <ul style="list-style-type: none"> • ROLL • AUTO_DISCONNECT • AUTO_RENEW 	Set by the Buyer. If not set by the Buyer, then this is set by the Seller. Roll indicates that the Product's contract will continue on a rolling basis for the duration of the Roll Interval at the end of the Term. Auto-disconnect indicates that the Product will be disconnected at the end of the Term. Auto-renew indicates that the Product's contract will be automatically renewed for the Term Duration at the end of the Term.
Roll Interval	The recurring period that the Buyer must pay to the end of upon disconnecting the Product after the original term has expired.	Duration	Set by Seller if Seller End of Term Action is Roll

Table 49 – Term Attributes

9.19 Appointment Attributes

This section is a placeholder for Appointment attributes that are being defined in the Sonata Trouble Ticketing Project. Once defined there, this section will be updated.

9.20 POQ Item Reference Attributes

Table 50 shows the POQ Item Reference Attributes.

Attribute	Description	Type	Comments
POQ Identifier	Identifier of the Product Offering Qualification	String	Reference to a POQ. Provided by the Buyer from the Seller's response to a Create POQ Request as specified in MEF 79 [8]. The Seller can make this field mandatory or optional. If mandatory, the Buyer must include the POQ Identifier.
POQ Item Identifier	Identifier of the Product Offering Qualification Item	String	A unique identifier of the POQ item. Provided by the Buyer from the Seller's response to a Create POQ Request as specified in MEF 79 [8]. Seller can make this field mandatory or optional.
Alternate Product Proposal Identifier	A unique identifier for this Alternate Product Proposal assigned by the Seller.	String	If the Buyer has performed a POQ and desires to select one and only one of the Alternate Product Proposals per Quote Item they identify the alternate proposal using the Alternate Product Proposal Identifier from the POQ response as specified in MEF 79 [8].

Table 50 – POQ Item Reference Attributes

9.21 Quote Item Reference Attributes

Table 51 shows the Quote Item Reference Attributes.

Attribute	Description	Type	Comments
Quote Identifier	Identifier of the Quote	Identifier	Reference to a Quote. Provided by the Buyer from the Seller's response to a Create Quote Request as specified in MEF 80 [10]. The Seller can make this field mandatory or optional. If mandatory, the Buyer must include the POQ Identifier.
Quote Item Identifier	Identifier of the Product Offering Qualification Item	String	A unique identifier of the POQ item. Provided by the Buyer from the Seller's response to a Create POQ Request as specified in MEF 80 [10]. Seller can make this field mandatory or optional.

Table 51 – Quote Item Reference Attributes

9.22 Duration

Table 52 shows the attributes for Duration.

Attribute	Description	Type	Comments
Duration Unit	The unit of the duration.	String one of the following: <ul style="list-style-type: none"> •BUSINESS_DAYS •BUSINESS_HOURS •BUSINESS_MINUTES •CALENDER_MONTHS •CALENDAR_DAYS •CALENDAR_HOURS •CALENDAR_MINUTES 	
Duration Value	The value of the duration.	Integer	

Table 52 – Duration Attributes

10 Product Order Requirements

This section contains the requirements for Product Orders for both Buyers and Sellers. Requirements for Sellers are divided into attributes that must be included in the Seller's initial response to the Buyer's Create Product Order request and requirements that apply to updates during the lifecycle of the Product Order that are performed by the Seller.

10.1 Create Product Order

This section defines the attributes and requirements for the Buyer's Create Product Order request and the Seller's Create Product Order response for INSTALL, CHANGE, and DISCONNECT Product Order Item Product Actions.

10.1.1 Buyer Create Product Order Request Product Order Level Attributes

This section defines the Product Order Level attributes and requirements for the Buyer's Create Product Order Request. These attributes and requirements are the same regardless of the Product Order Item Product Actions contained in Product Order Items within the Product Order.

- [R3] The Buyer's Create Product Order request **MUST** contain the following attributes as specified in Table 30:
- Product Order Contact
 - At least one Product Order Item (see section 10.1.4 for detail on Product Order Item requirements)
 - Buyer Request Date
- [O2] The Buyer's Create Product Order request **MAY** contain any attributes identified in Table 30 as settable by the Buyer and not included in [R3].
- [R4] The Buyer's Create Product Order request **MUST NOT** contain any attributes identified in Table 24 as settable by the Seller.
- [O3] The Seller **MAY** require that the Buyer perform a POQ prior to submitting the Product Order.
- [CR1]<[R4] The Buyer's Create Product Order request **MUST** contain the POQ Identifier if required by the Seller.
- [O4] The Seller **MAY** require that the Buyer perform a Quote prior to submitting the Product Order.
- [CR2]<[O4] The Buyer's Create Product Order request **MUST** contain the Quote Identifier if required by the Seller.

10.1.2 Create Product Order Seller Create Product Order Initial Response Product Order Level

This section defines the Product Order Level attributes and requirements for the Seller's initial response to a Create Product Order request. These attributes and requirements are the same regardless of the Product Order Item Product Actions contained in Product Order Items within the Product Order.

- [R5] When providing a response if the Seller Response Code indicates success, the Seller **MUST** specify the following attributes defined in Table 30 in the response:
- Product Order Identifier
 - Product Order Version
 - Product Order State
 - Seller Contact
- [R6] The Seller Product Order Identifier **MUST** remain the same value for the life of the Product Order.
- [R7] When providing a Response if the Seller Response Code does not indicate success, the Seller **MUST NOT** specify the Seller Product Order Identifier attribute in the response.
- [R8] The Seller's response **MUST** include Product Order attributes defined in Table 30 copied from the Buyer's Create Product Order request as specified in [R3] and [O2].
- [R9] The Seller **MUST** set the Seller Product Order Version to 1 (one) at the time that the Buyer Create Product Order is accepted.

10.1.3 Seller Product Order Lifecycle Updates Product Order Level

This section contains requirements for subsequent updates performed by the Seller on a Product Order at the Product Order level during the lifecycle of the Product Order.

- [R10] If the Product Order State in the Seller's response is FAILED, the Product Order Final State Date **MUST** contain the date the Product Order moved to the FAILED state.
- [R11] If the Product Order State in the Seller's response is CANCELLED, the Product Order Expected Completion Date attribute **MUST NOT** be provided.
- [O5] For all Product Order States other than FAILED and CANCELLED the Seller **MAY** include the Product Order Expected Completion Date.

- [R12] If the Product Order State in the Seller's response is COMPLETED, the response **MUST** contain the Product Order Closed Date attribute as defined in Table 30.
- [R13] The Seller **MUST** increment the Seller Product Order Version by 1 (one) each time an PATCH Request is accepted for this Product Order Identifier.
- [O6] The Seller **MAY** add a Note to any Product Order.

10.1.4 Buyer Create Product Order Product Order Item Common Requirements

This section defines the common attributes and requirements for the Buyer's Create Product Order request for at least two of the Product Order Item Product Actions as described.

- [R14] The Buyer's Create Product Order request **MUST** contain the Buyer Product Order Item Contact, the Buyer Implementation Contact, and the Buyer Technical Contact as specified in Table 32 The Buyer's Create Product Order request **MUST** contain the following attributes as specified in Table 25:
- Product Order Item Reference Number
 - Product Order Item Product Action
 - Product Order Item Requested Completion Date
- [O7] The Seller **MAY** require that the Buyer Billing Attributes be the same for all Product Order Items in a Product Order.
- [O8] The Buyer's Create Product Order request **MAY** contain the following as specified in as specified in Table 32:
- Product Order Item Coordinated Action
 - Product Order Item Note
 - Product Order Item Expedite Indicator
 - Product Order Item Term
 - Product Order Item End Customer Name
 - Related Buyer Purchase Product Order Number
 - Telecommunication Service Priority/Restoration Priority

- [R15] If the Product Action is INSTALL or CHANGE, the Buyer's Create Product Order request **MUST** contain the Product Specific Attributes as specified in Table 32.
- [R16] If the Buyer requires the Telecommunication Service Priority or restoration priority of the Product to be specified for the Product Order Item, the Buyer's Create Product Order request **MUST** contain the Product Order Item Telecommunication Service Priority/Restoration Priority as defined in Table 32.
- [R17] If the Product Specification requires a Place Relationship for an Product Order Item, the Buyer's Create Product Order request **MUST** contain the Product Order Item Service Site Contact as specified in Table 44
- [O9] If the Product Order Item Product Action is CHANGE or DISCONNECT, the Buyer's Create Product Order request **MAY** contain the Buyer Billing Information as specified in Table 32.
- [R18] The Buyer's Create Product Order request **MUST** contain the Buyer Billing information as specified in Table 38 for all Product Order requests or if there are multiple Buyer billing accounts.
- [R19] If the Product Order Item Location Type as defined in Table 44 is SERVICE_SITE_IDENTIFIER, the Buyer's Create Product Order request **MUST** contain a Service Site Identifier as defined in Table 44.
- [R20] If the Product Order Item Location Type as defined in Table 44 is FIELDDED_ADDRESS, the Buyer's Create Product Order request **MUST** contain the Fielded Address attributes defined in Table 44.
- [R21] If the Product Order Item Location Type as defined in Table 44 is FORMATTED_ADDRESS, the Buyer's Create Product Order request **MUST** contain the Formatted Address attributes defined in Table 44.
- [R22] If the Product Order Item Location Type as defined in Table 44 is GLOBAL_ADDRESS, the Buyer's Create Product Order Request **MUST** contain the Global Address attributes defined in Table 44.
- [R23] If the Product Order Item Location Type as defined in Table 44 is GEOGRAPHIC_POINTS, the Buyer's Create Product Order request **MUST** contain the Geographic Points attributes defined in Table 44.

10.1.5 Seller Create Product Order Initial Response Product Order Item Common Requirements

- [R24] The Seller's response to the Buyer's Create Product Order request **MUST** contain the Product Order Item State as defined in Table 32.
- [R25] The Seller's response **MUST** include all Product Order Item attributes as defined in Table 32 copied from the Buyer's Create Product Order request.

- [R26] If the Buyer's Create Product Order request Product Order Item Expedite Indicator is FALSE, the Seller's response **MUST NOT** have the Product Order Item Expedite Accepted attribute set to TRUE.
- [R27] The Seller's response **MUST NOT** include the Product Order Item Expedite Accepted attribute set to TRUE until the Charge for any charges associated with the expedite is complete.

10.1.6 Seller Lifecycle Response Product Order Item Common Requirements

This section defines the attributes and requirements for the Seller's response for a Product Order Item during the lifecycle of the Product Order.

- [R28] If there are any additional construction costs associated with the Product Order Item and the Product Order State is HELD, the Seller's response **MUST** have the Product Order Item Construction Cost attribute set to TRUE.
- [R29] If there are not any additional construction costs associated with the Product Order Item, the Seller's response **MUST NOT** have the Product Order Item Construction Cost attribute set to TRUE.
- [R30] If the Product Order Item Construction Cost attribute in the Seller's response is set to TRUE, the response **MUST** include the Product Order Item Construction Cost Value as defined in Table 17.

10.1.7 Buyer Create Product Order Product Order Item with Product Action INSTALL

This section defines the attributes and requirements for the Buyer's Create Product Order request when a Product Order Item Product Action is INSTALL.

- [R31] If there is a relationship with another Product Order Item, the Buyer's Create Product Order request **MUST** contain the Product Order Item Relationship as specified in Table 32.
- [R32] The Buyer's Create Product Order request **MUST** contain a Product Order Item Product Offering Identifier.
- [R33] If the Product Order Item Product Action is INSTALL, the Buyer **MUST** include the Buyer Billing Account as specified in Table 25 and Table 38.
- [R34] If the Buyer desires a coordinated action between Product Order Items, the Buyer's Create Product Order request **MUST** contain the Product Order Item Coordinated Action attributes as defined in Table 32 and Table 40.

10.1.8 Seller Create Product Order Initial Response Product Order Item with Product Action INSTALL

This section defines the attributes and requirements for the Seller's Response to a Buyer's Create Product Order request when the Product Order Item Product Action is INSTALL.

- [R35] If the Buyer Create Product Order request does not contain a value for the Product Order Item Term duration, the Seller **MUST** include a value in their response.
- [R36] If the Seller provides a value for Product Order Item Term, it **MUST** be equal to the value returned for the specified Product Quote and Product Quote Item Quote Item Term.

10.1.9 Seller Create Product Order Lifecycle Response Product Order Item with Product Action INSTALL

This section defines the attributes and requirements for the Seller's response for a Product Order Item with a Product Action of INSTALL during the lifecycle of the Product Order.

- [R37] If the Product Order Item State in the Seller's response is FAILED, the Product Order Item Failed Date **MUST** contain the date the Product Order Item moved to the FAILED state.
- [R38] If the Product Order Item State in the Seller's response is IN_PROGRESS, the Product Order Item Expected Completion Date attribute defined in Table 32 **MUST** be provided.
- [R39] If the Product Order Item State in the Seller's response is CANCELLED, the Product Order Item Expected Completion Date attribute **MUST NOT** be provided.
- [O10] For all Product Order Item States other than IN_PROGRESS, FAILED, and CANCELLED the Seller **MAY** include the Product Order Item Expected Completion Date.
- [R40] If the Product Order Item State in the Seller's response is COMPLETED, the response **MUST** contain the Product Order Item Completion Date attribute as defined in Table 32.
- [R41] If the Product Order Item State in the Seller's response is not COMPLETED, the response **MUST NOT** contain the Product Order Item Completion Date attribute.
- [R42] If the Seller revises the Expected Completion Date for any Product Order Item, they **MUST** include a Product Order Item Note that indicates that the date has been revised and the reason for the revision.

10.1.10 Buyer Create Product Order Product Order Item Product Action CHANGE

The following requirements apply to Buyer's Create Product Order request with a Product Order Item Activity Type of CHANGE.

- [R43] If there is a relationship with another Product Order Item, the Buyer's Create Product Order request **MUST** contain the Product Order Item Relationship as specified in Table 32.
- [R44] If the Product Order Item Product Action is CHANGE, the Buyer's Create Product Order request **MUST** contain a Product Order Item Product Identifier for an existing product.
- [O11] If the Product Order Item Product Action is CHANGE, the Buyer **MAY** include the Buyer Billing Account as specified in Table 25 and Table 38.
- [O12] The Seller **MAY** require that the Buyer Billing Attributes be the same for all Product Order Items in a Product Order.

10.1.11 Seller Create Product Order Initial Response Product Order Item with Product Action CHANGE

This section defines the attributes and requirements for the Seller's Response to a Buyer's Create Product Order request when the Product Order Item Product Action is CHANGE.

- [R45] If there are any additional construction costs and the Product Order State is ASSESSING_CHARGE or IN_PROGRESS, the Seller's response **MUST** have the Product Order Item Construction Cost attribute set to TRUE.
- [R46] If the Construction Cost attribute in the Seller's response is set to TRUE, the response **MUST** include the Product Order Item Construction Cost Value as defined in Table 17.

10.1.12 Seller Product Order Lifecycle Response Product Order Item with Product Action CHANGE

This section defines the attributes and requirements for the Seller's response for a Product Order Item with a Product Action of CHANGE during the lifecycle of the Product Order.

- [R47] If the Product Order State in the Seller's response is FAILED, the Product Order Item Failed Date **MUST** contain the date the Product Order moved to the FAILED state.
- [R48] If the Product Order State in the Seller's response is IN_PROGRESS, the Product Order Item Expected Completion Date attribute defined in Table 32 **MUST** be provided.

10.1.13 Buyer Create Product Order Product Order Item Product Action DISCONNECT

The following requirements apply to Buyer's Create Product Order request with a Product Order Item Product Action of DISCONNECT.

- [R49] The Buyer's Create Product Order request **MUST** contain a Product Order Item Product Identifier for the existing product to be disconnected.

- [O13] If the Product Order Item Product Action is DISCONNECT, the Buyer **MAY** include the Buyer Billing Account as specified in Table 25 and Table 38.

10.1.14 Seller Create Product Order Initial Response with Product Order Item Product Activity DISCONNECT

This section defines the attributes and requirements for the Seller's Response to a Buyer's Create Product Order request when the Product Order Item Product Activity is DISCONNECT.

- [R50] The Seller's response to the Buyer's Create Product Order request **MUST** contain the Product Order Item State as defined in Table 32.

10.1.15 Seller Create Product Order Lifecycle Response with Product Order Item Product Activity DISCONNECT

This section defines the attributes and requirements for the Seller's response for a Product Order Item with a Product Action of DISCONNECT during the lifecycle of the Product Order.

- [R51] If the Product Order Item State in the Seller's response is FAILED, the Failed Date **MUST** contain the date the Product Order Item moved to the FAILED state.
- [R52] If the Product Order Item State in the Seller's response is IN_PROGRESS, the Product Order Item Expected Completion Date attribute defined in Table 30 **MUST** be provided.
- [R53] If the Product Order Item State in the Seller's response is CANCELLED, the Product Order Item Expected Completion Date attribute **MUST NOT** be provided.
- [O14] For all Product Order Item States not described in FAILED and CANCELLED the Seller **MAY** include the Product Order Item Expected Completion Date.
- [R54] If the Product Order Item State in the Seller's response is COMPLETED, the response **MUST** contain the Product Order Item Completion Date attribute as defined in Table 30.
- [R55] If the Product Order Item State in the Seller's response is not COMPLETED, the response **MUST NOT** contain the Product Order Item Completion Date attribute.

10.2 Update Product Order Attributes

The Buyer has a limited ability to update Product Order Attributes. The Update Product Order attributes requirements are defined in this section.

10.2.1 Buyer Update Product Order Attributes Request

The requirements for a Buyer updating a Product Order are defined in this section.

A Buyer is limited to updating the Product Order Attributes shown in Table 31.

- [R56] A Buyer's Update Product Order Attributes request **MUST** contain the following attributes:
- Product Order Identifier
 - Product Order Version
- [R57] A Buyer's Update Product Order Attributes request **MUST** contain one or more of the updateable attributes shown in Table 31.
- [R58] A Buyer's Update Product Order Attributes request **MUST NOT** contain attributes not included in [R56] and [R57].

10.2.2 Seller Update Product Order Attributes Response

The requirements for a Seller responding to a Buyer's Update Product Order Attributes request are defined in this section.

- [R59] The Seller **MUST** indicate if the Update Product Order Attributes request was successful or not using the Seller Response Code.

If successful, the Seller updates the Product Order Attribute(s) as requested by the Buyer. If not successful, the Seller does not update the Product Order Attribute(s) as requested by the Buyer.

10.3 Update Product Order Item Attributes

The Buyer has a limited ability to update Product Order Item Attributes. The Update Product Order Item Attributes requirements are defined in this section.

10.3.1 Buyer Update Product Order Item Attributes Request

The requirements for a Buyer updating a Product Order Item are defined in this section.

A Buyer is limited to updating the Product Order Item Attributes shown in Table 33.

- [R60] A Buyer's Update Product Order Item Attributes request **MUST** contain the following attributes:
- Product Order Identifier
 - Product Order Version
 - Product Order Item Reference Identifier
- [R61] A Buyer's Update Product Order Item Attributes request **MUST** contain one or more of the updateable attributes shown in Table 33.

- [R62] A Buyer's Update Product Order Attributes request **MUST NOT** contain attributes not included in [R60] and [R61].

10.3.2 Seller Update Product Order Attributes Response

The requirements for a Seller responding to a Buyer's Update Product Order Attributes request are defined in this section.

- [R63] The Seller **MUST** indicate if the Update Product Order Item Attributes request was successful or not using the Seller Response Code.

If successful, the Seller updates the Product Order Item Attribute(s) as requested by the Buyer. If not successful, the Seller does not update the Product Order Item Attribute(s) as requested by the Buyer.

10.4 Modify Product Order Item Completion Date

There are two functions supported by the Modify Product Order Item Completion Date request. These are changing the Expedite Indicator and changing the Requested Completion Date of the Product Order Item. Each of these are shown in this section.

10.4.1 Expedite Product Order Item

The expedite Product Order Item function requirements are defined in this section.

10.4.1.1 Buyer Create Modify Product Order Item Completion Date Request

This section defines the Modify Product Order Item Completion Date attributes and requirements for the Buyer's Create Modify Product Order Item Completion Date request to expedite a Product Order Item.

- [R64] The Buyer's Create Modify Product Order Item Completion Date request **MUST** contain the following attributes as specified in Table 35:

- Product Order Identifier
- Product Order Item Reference Identifier
- Product Order Item Expedite Indicator

- [O15] The Buyer's Create Modify Product Order Item Completion Date request **MAY** contain the Product Order Item Requested Completion Date as specified in Table 35.

10.4.1.2 Seller Create Modify Product Order Item Response

This section defines the requirements for the Seller's response to a Create Modify Product Order Item Completion Date request to expedite a Product Order Item.

- [R65] When providing a response if the Seller Response Code indicates success, the Seller **MUST** specify the following attributes defined in Table 35 in the response:
- Modify Product Order Item Completion Date Identifier
 - Modify Product Order Item Completion Date State
- [R66] The Seller response **MUST** echo back all attributes and values in the Buyer's request.
- [R67] The Seller Modify Product Order Item Completion Date Identifier **MUST** remain the same value for the life of the Modify Product Order Item Completion Date request.

10.4.2 Modify Product Order Item Requested Completion Date

This section defines the requirements for the Modify Product Order Item Completion Date when the Buyer desires to modify the Requested Completion Date.

10.4.2.1 Buyer Create Modify Product Order Item Completion Date Request

This section defines the Modify Product Order Item Completion Date attributes and requirements for the Buyer's Create Modify Product Order Item Completion Date to modify the Requested Completion Date of the Product Order Item.

- [R68] The Buyer's Create Modify Product Order Item Completion Date request to modify the Requested Completion Date **MUST** contain the following attributes as specified in Table 35:
- Product Order Identifier
 - Product Order Item Reference Identifier
 - Product Order Item Requested Completion Date

10.4.2.2 Seller Create Modify Product Order Item Completion Date Response

This section defines the requirements for the Seller's response to a Create Modify Product Order Item Completion Date request to modify the Requested Completion Date.

- [R69] When providing a Response if the Seller Response Code indicates success, the Seller **MUST** specify the following attributes defined in Table 35 in the response:
- Modify Product Order Item Completion Date Identifier
 - Modify Product Order Item Completion Date State

- [R70] The Seller response **MUST** echo back all attributes and values from the Buyer's request.
- [R71] The Seller Modify Product Order Item Completion Date Identifier **MUST** remain the same value for the life of the Modify Product Order Item Completion Date.

10.5 Charge

This section defines the attributes and requirements for the Charge that is initiated by the Seller and responded to by the Buyer.

10.5.1 Initiate Charge

This section defines the attributes and requirements of the Charge. The Charge is initiated by the Seller when they determine that there is a charge associated with a Product Order Item contained within a Product Order, associated to a Cancel Product Order request, or associated to a Modify Product Order Item Completion Date request. The Seller creates the Charge internal to their systems and sends a Charge Initiation notification to the Buyer that contains the Charge Identifier if the Buyer has subscribed to notifications.

The contents of the Charge are defined in the following requirements.

- [R72] When the Seller initiates the Charge, the following, as defined in Table 46 **MUST** be included:
- Charge Identifier
 - Product Order Identifier
 - Product Order Item Reference Identifier
 - Charge Item Identifier(s)
 - Response Due Date
 - Charge State
- [R73] For each Charge Item included in the Charge, the Seller **MUST** include the following attributes as defined in Table 47:
- Charge Item Identifier
 - Charge Type
 - Charge Description
 - Charge Activity Type

- Blocking
- Charge Price
- Charge Item State

[R74] Table 53 shows the attributes that **MUST** be included in the Charge Item based on the

Charge Type	Recurring Charge Period	Charge Item Unit of Measure	Charge Price	Comments
RECURRING	X		X	
NON-RECURRING			X	
USAGE_BASED		X	X	Usage based Price Duty Free Amount is the charge per Unit of Measure

Table 53 – Price Type Required Information

10.6 Buyer Response to Charge

This section defines the attributes and requirements for the Buyer's response to the Charge. The Buyer responds to the Charge by updating the Charge Acceptance Indicator for each Charge Item contained within the Charge.

[R75] The Buyer's response to the Charge **MUST** update the following as defined in Table 47 for each Charge Item included in the Charge:

- Charge Acceptance Indicator

[R76] The Buyer **MUST** update all Charge Items included in a Charge at one time.

10.7 Create Cancel Product Order Request

This section defines the requirements for the Buyer's Create Cancel Product Order request and the Seller's Create Cancel Product Order response. The Cancel Product Order cancels the Product Order and all associated Product Order Items.

[R77] A Buyer **MUST** have submitted the Product Order Request to be able to submit a Cancel Request on the Product Order.

10.7.1 Buyer Create Cancel Product Order Request

This section defines the Cancel Product Order attributes and requirements for the Buyer's Create Cancel Product Order request.

[R78] The Buyer's Create Cancel Product Order request **MUST** contain the following attributes as specified in Table 36:

- Product Order Identifier
- Product Order Version
- Cancel Request Product Order Contact

[O16] The Buyer's Create Product Order Cancel Request **MAY** contain the following attributes as specified in Table 36:

- Note
- Cancellation Reason Type
- Cancellation Reason

10.7.2 Seller Create Cancel Product Order Response

This section defines the requirements for the Seller's response to a Create Cancel Product Order request.

[R79] If the Seller Response Code indicates success, the Seller **MUST** echo back all Buyer specified attributes in the Buyer's Cancel Product Order Request.

[R80] If the Seller Response Code indicates success, the Seller **MUST** specify the following attributes defined in Table 36 in the response:

- Cancel Product Order Identifier
- Cancel Product Order State
- Cancel Product Order Expected Completion Date
- Seller Contact

[R81] The Seller Cancel Product Order Identifier **MUST** remain the same value for the life of the Cancel Product Order.

[R82] When providing a Response if the Seller Response Code does not indicate success, the Seller **MUST NOT** specify the Seller Cancel Identifier attribute in the response.

10.8 Retrieve Product Order List

This section defines the attributes and requirements associated with Retrieve Product Order List (Use Case 2). This includes the Buyer's Retrieve Product Order List request and the Seller's Retrieve Product Order List response.

10.8.1 Buyer Retrieve Product Order List Request

This section defines the attributes and requirements for the Buyer's Retrieve Product Order List request.

[O17] The Buyer's Retrieve Product Order List request **MAY** contain the following attributes as defined in Table 30:

- Requested Product Order Completion Date (range of dates)
- Product Order Expected Completion Date (range of dates)
- Product Order Accept Date (range of dates)
- Product Order Cancellation Date (range of dates)
- Product Order Closed Date (range of dates)
- Project Identifier
- Product Order State
- Buyer Product Order Identifier

10.8.2 Seller Retrieve Product Order List Response

This section defines the attributes and requirements for the Seller's response to a Buyer's Retrieve Product Order List request.

[R83] If successful, the Seller's response to the Buyer's Retrieve Product Order List request **MUST** contain the following from Table 30 for each Product Order Identifier that matches the filter criteria:

- Buyer Filter Criteria (as specified by Buyer in Retrieve section 10.8.1)
- Product Order Identifier
- Product Order Version
- Buyer Product Order Identifier
- Requested Product Order Completion Date

- Product Order Accept Date
- Product Order Cancellation Date
- Product Order State
- Product Order Closed Date
- Project Identifier

[R84] If the Seller Response Code does not indicate success, the Seller **MUST** only reply with the Response Code and no attributes.

10.9 Retrieve Product Order by Product Order Identifier

This section defines the attributes and requirements associated with Retrieve Product Order by Product Order Identifier (Use Case 3). This includes the Buyer's Retrieve Product Order by Product Order Identifier request and the Seller's Retrieve Product Order by Product Order Identifier response.

10.9.1 Buyer Retrieve Product Order by Product Order Identifier Request

This section defines the attributes and requirements for the Buyer's Retrieve Product Order by Product Order Identifier request.

[R85] The Buyer **MUST** include the Seller Product Order Identifier as specified in Table 30 in their Retrieve Product Order by Product Order Identifier request.

10.9.2 Seller Query Product Order by Identifier Response

This section defines the attributes and requirements for a Seller's response to the Buyer's Retrieve Product Order by Product Order Identifier Request.

[R86] The Seller's response **MUST** comply with the states and attributes detailed in Table 54 and Table 55.

In Table 54 the Product Order attributes either Echoed from the Buyer's Create Product Order request shown by an "E", Required to be provided by the Seller shown by an "R", Required if Populated by the Seller shown by an "PR", or Optional to be provided by the Seller or the Buyer shown by an "O".

Product Order Management

	ACKNOWLEDGED	ASSESSING_CANCELLATION	ASSESSING_CHARGE	CANCELLED	CANCELLING	COMPLETE	FAILED	IN_PROGRESS	PARTIAL	REJECTED
Product Order Identifier	R	R	R	R	R	R	R	R	R	R
Product Order Version	R	R	R	R	R	R	R	R	R	R
Buyer Product Order Identifier	E	E	E	E	E	E	E	E	E	E
Buyer Request Date	E	E	E	E	E	E	E	E	E	E
Project Identifier	E	E	E	E	E	E	E	E	E	E
Product Order State	R	R	R	R	R	R	R	R	R	R
Seller Contact	R	R	R	R	R	R	R	R	R	R
Cancellation Reason				E – Buyer R- Seller						
Product Order Cancellation Date				R						
Product Order Expected Completion Date		R	R	O	R	O	O	R	O	
Product Order Final State Date				R		R	R		R	R
Product Order Cancellation Date				R						
Note	E - Buyer PR - Seller	E - Buyer PR - Seller	E - Buyer PR - Seller	E - Buyer PR - Seller	E - Buyer PR - Seller	E - Buyer PR - Seller	E - Buyer PR - Seller	E - Buyer PR - Seller	E - Buyer PR - Seller	E - Buyer PR - Seller
Termination Error							R			R

Table 54 – Seller Response Product Order Attributes Based on Product Order State

In Table 55 the Product Order Item attributes either Echoed from the Buyer’s Create Product Order request shown by an “E”, Required to be provided by the Seller shown by an “R”, Required if Populated by the Seller shown by an “PR”, or Optional to be provided by the Seller or the Buyer shown by an “O”.



Product Order Management

	ACKNOWLEDGED	ASSESSING_CANCELLATION	ASSESSING_CHANGE	CANCELLED	CANCELLING	COMPLETE	FAILED	HELD	IN_PROGRESS	PENDING	REJECTED	VALIDATED
Product Order Item Reference Number	E	E	E	E	E	E	E	E	E	E	E	E
Seller Product Order Item Identifier	R	R	R	R	R	R	R	R	R	R	R	R
Product Order Item Product Action	E	E	E	E	E	E	E	E	E	E	E	E
Product Order Item Product Identifier	E	E	E	E	E	E	E	E	E	E	E	E
Product Order Item Product Offering Identifier	E	E	E	E	E	E	E	E	E	E	E	E
Product Order Item Product Specific Attributes	E	E	E	E	E	E	E	E	E	E	E	E
Place Relationship	E	E	E	E	E	E	E	E	E	E	E	E
Product Order Item End Customer Name	E	E	E	E	E	E	E	E	E	E	E	E
Product Order Item Relationship	E	E	E	E	E	E	E	E	E	E	E	E
Product Order Item Coordinated Action	E	E	E	E	E	E	E	E	E	E	E	E
Product Relationship	E	E	E	E	E	E	E	E	E	E	E	E
Product Order Item Note	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer
	PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller
Product Order Item Requested Completion Date	E	E	E	E	E	E	E	E	E	E	E	E
Product Order Item Expedite Indicator	E	E	E	E	E	E	E	E	E	E	E	E
Product Order Item Expedite Accepted Indicator	PR	PR	PR	PR	PR	PR	PR	PR	PR	PR	PR	PR



Product Order Management

	ACKNOWLEDGED	ASSESSING_CANCELLATION	ASSESSING_CHANGE	CANCELLED	CANCELLING	COMPLETE	FAILED	HELD	IN_PROGRESS	PENDING	REJECTED	VALIDATED
Product Order Item Charges		PR	PR	PR	PR	PR	PR	PR	PR	PR		PR
Product Order Item Telecommunications Service Priority/Restoration Priority	E	E	E	E	E	E	E	E	E	E	E	E
Buyer Product Order Item Contact	E	E	E	E	E	E	E	E	E	E	E	E
Buyer Implementation Contact	E	E	E	E	E	E	E	E	E	E	E	E
Buyer Technical Contact	E	E	E	E	E	E	E	E	E	E	E	E
Product Order Item Failed Date							R					
Product Order Item Expected Completion Date		R	R	R	R	R	R	R	R	R		
Product Order Item Completion Date						R						
Product Order Item POQ Attributes	E	E	E	E	E	E	E	E	E	E	E	E
Product Order Item State	R	R	R	R	R	R	R	R	R	R	R	R
Product Order Item Quote Attributes	E	E		E	E	E	E	E	E	E	E	E
Charge Identifier		PR	PR	PR	PR	PR	PR	PR	PR	PR		PR
Product Order Item Term	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E	E - Buyer
		PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller		PR - Seller
Related Buyer Purchase Product Order Number	E	E	E	E	E	E	E	E	E	E	E	E
Buyer Billing Information	E	E	E	E	E	E	E	E	E	E	E	E
Appointment		E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E - Buyer	E	E - Buyer
		PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller	PR - Seller		PR - Seller

Table 55 – Seller Response Product Order Attributes Based on Product Order State

10.10 Retrieve Modify Product Order Item Completion Date List

This section defines the attributes and requirements associated with Retrieve Modify Product Order Item Completion Date List. This includes the Buyer's Retrieve Modify Product Order Item Completion Date List request and the Seller's Retrieve Expedite Product Order Item List Response.

10.10.1 Buyer Retrieve Modify Product Order Item Completion Date List Request

This section defines the attributes and requirements for the Buyer's Retrieve Modify Product Order Item Completion Date List Request.

[O18] The Buyer's Retrieve Modify Product Order Item Completion Date List Request **MAY** contain at least one of the following attributes as defined in Table 35:

- Product Order Identifier
- Modify Product Order Item Completion Date State
- Modify Product Order Item Completion Date Create Date

10.10.2 Seller Retrieve Product Order Item Date List Response

This section defines the attributes and requirements for the Seller's Response to a Buyer's Retrieve Product Order Item Date List Request.

[R87] The Seller's response to the Buyer's Retrieve Modify Product Order Item Completion Date List request **MUST** contain the following from for each Modify Product Order Item Completion Date Identifier that matches the filter criteria:

- Modify Product Order Item Completion Date Identifier
- Product Order Identifier
- Product Order Item Reference Identifier
- Product Order Item Expedite Indicator
- Product Order Item Requested Completion Date
- Modify Product Order Item State

[R88] If the Seller Response Code indicates success, the Seller **MUST** specify at least zero or more Expedite Product Order Item Identifiers in their response.

- [R89]** If the Seller Response Code does not indicate success, the Seller **MUST NOT** reply with any of the attributes in Table 35.

10.11 Retrieve Modify Product Order Item Completion Date Details by Modify Product Order Item Completion Date Identifier

This section defines the attributes and requirements associated with Retrieve Modify Product Order Item Completion Date Details by Modify Product Order Item Completion Date Identifier. This includes the Buyer's Retrieve Modify Product Order Item Completion Date Details by Expedite Product Order Item Date Identifier Request and the Seller's Retrieve Modify Product Order Item Completion Date Details by Modify Product Order Item Completion Date Identifier Response.

10.11.1 Buyer Retrieve Modify Product Order Item Completion Date Details by Modify Product Order Item Completion Date Identifier Request

This section defines the attributes and requirements for the Buyer's Retrieve Modify Product Order Item Completion Date Details by Modify Product Order Item Completion Date Identifier Request.

- [R90]** The Buyer **MUST** include the Seller Modify Product Order Item Completion Date Identifier as specified in Table 35 in their Retrieve Modify Product Order Item Completion Date Details by Modify Product Order Item Completion Date Identifier Request.

10.11.2 Seller Retrieve Modify Product Order Item Completion Date Details by Modify Product Order Item Completion Date Identifier Response

This section defines the attributes and requirements for a Seller's response to the Buyer's Retrieve Modify Product Order Item Completion Date Details by Modify Product Order Item Completion Date Identifier Request.

- [R91]** If the Seller Response Code indicates success and a matching Modify Product Order Item Completion Date Identifier is found, the Seller's response **MUST** include the following attributes as shown in Table 35:

- Modify Product Order Item Completion Date Identifier
- Product Order Identifier
- Product Order Item Reference Identifier
- Product Order Item Expedite Indicator
- Product Order Item Requested Completion Date
- Modify Product Order Item Completion Date State

- [R92] If the Seller Response Code indicates success and no matching Expedite Product Order Item Identifier is found, the Seller's response **MUST** echo back the attributes in the Buyer's request with an error indicating a match was not found.
- [R93] If the Seller Response Code does not indicate success, the Seller **MUST NOT** reply with any of the attributes in Table 35.

10.12 Retrieve Cancel Product Order List

This section defines the attributes and requirements associated with Retrieve Cancel Request List. This includes the Buyer's Retrieve Cancel List Request and the Seller's Retrieve Cancel Product Order List Response.

10.12.1 Buyer Retrieve Cancel Product Order List Request

This section defines the attributes and requirements for the Buyer's Retrieve Cancel Request List Request.

- [O19] The Buyer's Retrieve Cancel Product Order List Request **MAY** contain at least one of the following attributes as defined in Table 36:
- Product Order Identifier
 - Cancel Product Order State
 - Cancellation Reason Type
 - Cancel Request Completed Date (range of dates)

10.12.2 Seller Retrieve Cancel Product Order List Response

This section defines the attributes and requirements for the Seller's Response to a Buyer's Retrieve Cancel Product Order List Request.

- [R94] If the Seller Response Code indicates success, the Seller **MUST** echo back all attributes included in the Buyer's Retrieve Cancel Product Order List request.
- [R95] The Seller's response to the Buyer's Retrieve Cancel Product Order List request **MUST** contain the following from Table 36 for each Seller Cancel Identifier that matches the filter criteria:
- Seller Cancel Product Order Identifier
 - Product Order Identifier
 - Cancel Product Order State

- Cancel Request Completed Date

[R96] If the Seller Response Code indicates success, the Seller **MUST** specify zero or more Cancel Identifiers in their response.

[R97] If the Seller Response Code does not indicate success, the Seller **MUST NOT** reply with any of the attributes in Table 36.

10.13 Retrieve Cancel Product Order by Seller Cancel Product Order Identifier

This section defines the attributes and requirements associated with Retrieve Cancel Product Order Details by Seller Cancel Product Order Identifier. This includes the Buyer's Retrieve Cancel Product Order by Seller Cancel Product Order Identifier Request and the Seller's Retrieve Cancel Product Order by Seller Cancel Product Order Identifier Response.

10.13.1 Buyer Retrieve Cancel Product Order by Seller Cancel Product Order Identifier Request

This section defines the attributes and requirements for the Buyer's Retrieve Cancel Product Order by Seller Cancel Product Order Identifier Request.

[R98] The Buyer **MUST** include the Seller Cancel Product Order Identifier as specified in Table 36 in their Retrieve Cancel Product Order by Seller Cancel Product Order Identifier Request.

10.13.2 Seller Retrieve Cancel Product Order by Seller Cancel Product Order Identifier Response

This section defines the attributes and requirements for a Seller's response to the Buyer's Retrieve Cancel Product Order by Seller Cancel Product Order Identifier Request.

[R99] The Seller's response **MUST** include the attributes per state of the Cancel Product Order as shown in Table 56.

In Table 56 the attributes are either Echoed from the Buyer's Request shown by an E, Required to be provided by the Seller shown by an R, Optional to be provided by the Seller or Buyer shown by an O, or not included in the response shown by a blank in the cell.

Cancel States			
	ACKNOWLEDGED	ACCEPTED	REJECTED
Seller Cancel Identifier	R	R	R
Product Order Identifier	E	E	E
Product Order Version	E	E	E
Buyer Product Order Identifier	E	E	E
Note	Buyer – E Seller - R	Buyer – E Seller - R	Buyer – E Seller - R

Cancel States			
	ACKNOWLEDGED	ACCEPTED	REJECTED
Cancel Request State	R	R	R
Cancel Request Contact	E	E	E
Seller Contact	R	R	R
Cancellation Type	E	E	E
Cancellation Reason	E	E	E

Table 56 – Seller’s Response Based on Cancel State

10.14 Retrieve Charge List

This section defines the attributes and requirements associated with Retrieve Charge List. This includes the Buyer’s Retrieve Charge List Request and the Seller’s Retrieve Charge List Response.

10.14.1 Buyer Retrieve Charge List Request

This section defines the attributes and requirements for the Buyer’s Retrieve Charge List Request.

[R100] The Buyer’s Retrieve Charge List Request **MUST** contain at least one of the following attributes as defined in Table 46:

- Charge Product Order Identifier
- Response Due Date
- Charge State

10.14.2 Seller Retrieve Charge List Response

This section defines the attributes and requirements for the Seller’s Response to a Buyer’s Retrieve Charge List Request.

[R101] If the Seller Response Code indicates success, the Seller **MUST** echo back all attributes included in the Buyer’s request.

[R102] If the Seller Response Code indicates success, the Seller **MUST** specify zero or more Charge Identifiers in their response.

[R103] If the Seller Response Code indicates success, the Seller’s response to the Buyer’s Retrieve Charge List request **MUST** contain the following from Table 46 for each Charge Identifier that matches the filter criteria:

- Charge Identifier
- Product Order Identifier

- Product Order Version
- Product Order Item Reference Identifier
- Charge Request State

[R104] If the Seller Response Code does not indicate success, the Seller **MUST NOT** reply with any of the attributes in Table 46.

10.15 Retrieve Charge Details by Charge Identifier

This section defines the attributes and requirements associated with Retrieve Charge Details by Charge Identifier. This includes the Buyer's Retrieve Charge Details by Charge Identifier Request and the Seller's Retrieve Charge Details by Charge Identifier Charge Response.

10.15.1 Buyer Retrieve Charge Details by Charge Identifier Charge Request

This section defines the attributes and requirements for the Buyer's Retrieve Charge Details by Charge Identifier Request.

[R105] The Buyer **MUST** include the Charge Identifier as specified in Table 46 in their Retrieve Charge Details by Charge Identifier request.

10.15.2 Seller Retrieve Charge Details by Charge Identifier Charge Response

This section defines the attributes and requirements for a Seller's response to the Buyer's Retrieve Charge Details by Charge Identifier Charge Request.

[R106] The Seller's response **MUST** include the attributes per Charge State as shown in Table 57.

In Table 57 the attributes are either echoed from the Buyer's Request shown by an E, required to be provided by the Seller shown by an R, optional to be provided by the Seller or Buyer shown by an O, or not included in the response shown by a blank in the cell.

Charge States			
	AWAITING_RESPONSE	COMPLETED	WITHDRAWN_BY_SELLER
Charge Identifier	E	E	E
Product Order Identifier	R	R	R
Product Order Version	R	R	R

Charge States			
	AWAITING_RESPONSE	COMPLETED	WITHDRAWN_BY_SELLER
Product Order Item Reference Number	R	R	R
Charge Item Identifier	R	R	R
Response Due Date	R	R	R
Charge State	R	R	R

Table 57 – Seller’s Response Based on Charge State

In Table 58 the attributes are either echoed from the Buyer’s Request shown by an E, required to be provided by the Seller shown by an R, optional to be provided by the Seller or Buyer shown by an O, or not included in the response shown by a blank in the cell.

Charge Identifier States				
	AWAITING_RESPONSE	ACCEPTED_BY_BUYER	DECLINED_BY_BUYER	WITHDRAWN_BY_SELLER
Charge Item Identifier	R	R	R	R
Charge Type	R	R	R	R
Charge Activity Type	R	R	R	R
Recurring Charge Period	R	R	R	R
Blocking	R	R	R	R
Charge Price	R	R	R	
Charge Acceptance Indicator		E	E	
Charge Identifier State	R	R	R	R

Table 58 – Seller’s Response Based on Charge Identifier State

10.16 Register for Notifications

This section defines the attributes and requirements associated with the Register for Notifications (Use Case 14). This includes the Buyer’s Register for Notifications Request and the Seller’s Register for Notifications Response.

10.16.1 Buyer Register for Notifications Request

This section defines the attributes and requirements for the Buyer’s Register for Notifications Request.

[O20] The Seller **MAY** support Notifications.

[CR3]<[O20] If the Action attribute in the Buyer's Register for Notifications request is START, the Buyer **MUST** specify the Return Address Information and List of Notification Types attributes shown in Table 42.

[CR4]<[O20] If the Action attribute in the Buyer's Register for Notifications request is STOP, the Buyer **MUST** specify the List of Notification Types to be stopped.

10.16.2 Seller Register for Notification Response

This section defines the attributes and requirements for a Seller's response to the Buyer's Register for Notifications request. It is expected that the Seller's response is simply an acknowledgement of the request outside of the API.

10.17 Seller Send Notification

This section defines the attributes and requirements associated with the Seller Notification Use Case (Use Case 15).). If the Buyer responds to a Notification received from the Seller is beyond the scope of this document. It will be addressed in the Developer's Guide.

[R107] The Seller **MUST NOT** send Notifications to Buyers for Seller Object Identifier Types for which the Buyer has not registered.

[R108] The Seller **MUST** send Notifications to Buyers for Seller Object Identifier Types for which the Buyer has registered.

[R109] Notifications **MUST** include all Attributes shown in Table 43.

[R110] If the Seller Object Identifier Type is PRODUCT ORDER, the Notification **MUST** include the Product Order Identifier.

[R111] If the Seller Object Identifier Type is CANCEL, the Notification **MUST** include the Seller Cancel Identifier.

[R112] If the Seller Object Identifier Type is CHARGE_PROCESS, the Notification **MUST** include the Charge Identifier.

10.18 Specifying the Buyer Identifier and the Seller Identifier

[R113] For an explanation of the use of the Seller and Buyer Identifiers please MEF 79 [8] section 8.8.

11 Product Ordering State Machines

State diagrams are used to give an abstract description of the behavior of a system. This behavior is analyzed and represented in a series of events, that could occur in one or more possible states. The below state diagrams and state definitions are adapted from TMF622 [11] (Product Ordering API REST Specification) and should be used to convey Product Order, Product Order Item, Cancel Process, and Charge states during the lifecycle of Product Ordering.

11.1 Product Order State Machines

The Product Order States and State Machines are detailed in this section.

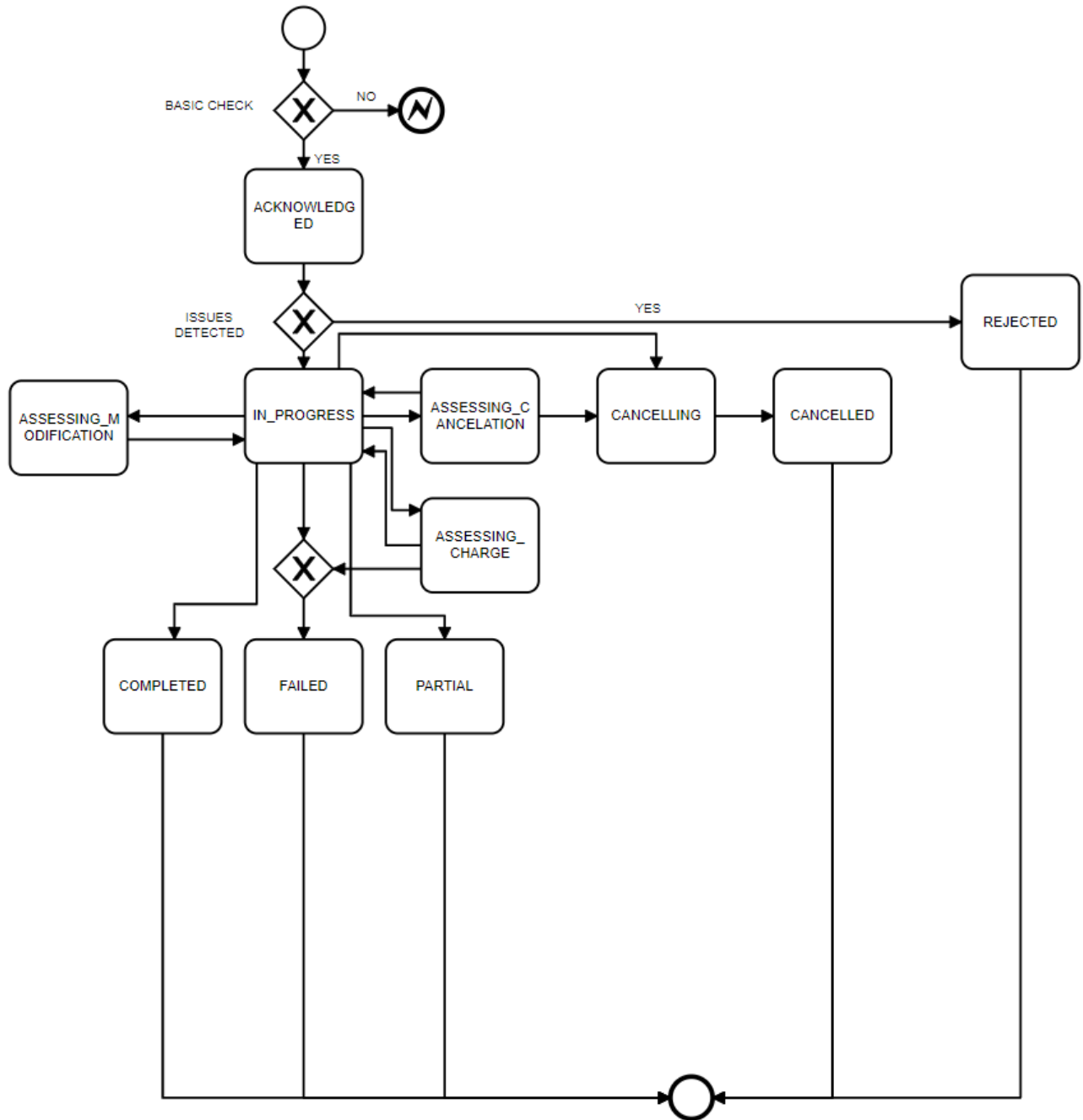


Figure 3 – Product Order Process Flow

State	Description
ACKNOWLEDGED	A Product Order has been received by the Seller and has passed basic validation. A Product Order Identifier is assigned in the ACKNOWLEDGED state and a response is returned to the Buyer. The Product Order remains in the ACKNOWLEDGED state while validations of Product Order and Product Order Item(s) attributes as applicable is completed. If the Product Order and Product Order Item attributes are validated the Product Order moves to the IN_PROGRESS state. If not validated, the Product Order moves to the REJECTED state.
ASSESSING_CANCELLATION	A request has been made by the Buyer to cancel the Product Order and the Product Order is currently being assessed to determine whether it can be cancelled. If there are any charges associated with the Buyer's Cancel Request, the Seller initiates a Charge which communicates the related charges to the Buyer, the Product Order remains in the ASSESSING_CANCELLATION state until the Charge is completed or withdrawn by the Seller. Once the cancellation assessment is complete, the Product Order returns to the IN_PROGRESS state.
ASSESSING_CHARGE	A Charge has been initiated by the Seller that is not the result of a Modify Product Order Item or Cancel Product Order request and the Seller is awaiting a Buyer response to the Charge. If a blocking or non-blocking charge is accepted by the Buyer, the Product Order moves to IN_PROGRESS. If a non-blocking charge is declined by the Buyer, the Product Order moves to IN_PROGRESS. If a blocking charge is declined by the Buyer and there are no unrelated Product Order Items in the Product Order, the Product Order moves to the FAILED state. If a blocking charge is declined by the Buyer and there are unrelated Product Order Items in the Product Order, the Product Order moves to the IN_PROGRESS state.

ASSESSING_MODIFICATION	A request has been made by the Buyer to modify the either the Expedite Indicator or the Requested Completion Date of a Product Order Item. The Product Order Item is currently being assessed to determine whether the Modify Product Order Item Completion Date is valid. If there is a charge associated with the Modify Product Order Item Completion Date, the Product Order remains in the ASSESSING_MODIFICATION state until the Charge is completed or withdrawn by the Seller. Once the Buyer's request has been validated and any associated Charges completed, the Product Order returns to the IN_PROGRESS state.
CANCELLED	The In-Flight Product Order has been successfully cancelled. This is a terminal state.
CANCELLING	The Buyer's Cancel Request has been assessed and it has been determined that it is feasible to proceed with the cancellation. This state can also result from a Seller cancelling the Product Order within their systems without a request from the Buyer.
COMPLETED	The Product Order has completed fulfillment and the Product is now active. This is a terminal state
FAILED	All Product Order Items have failed which results in the entire Product Order failing. This is a terminal state.
IN_PROGRESS	The Product Order has been successfully validated, and fulfillment has started.
PARTIAL	Fulfillment of at least one Product Order Item has failed, and fulfillment of at least one Product Order Item has been successful. This is a terminal state.
REJECTED	A Product Order was submitted, and it has failed at least one of the validation checks the Seller performs after it reached the ACKNOWLEDGED state.

Table 59 – Product Order Process Flow States

11.2 Product Order Item State Machine

The Product Order Item States and State machine are detailed in this section.

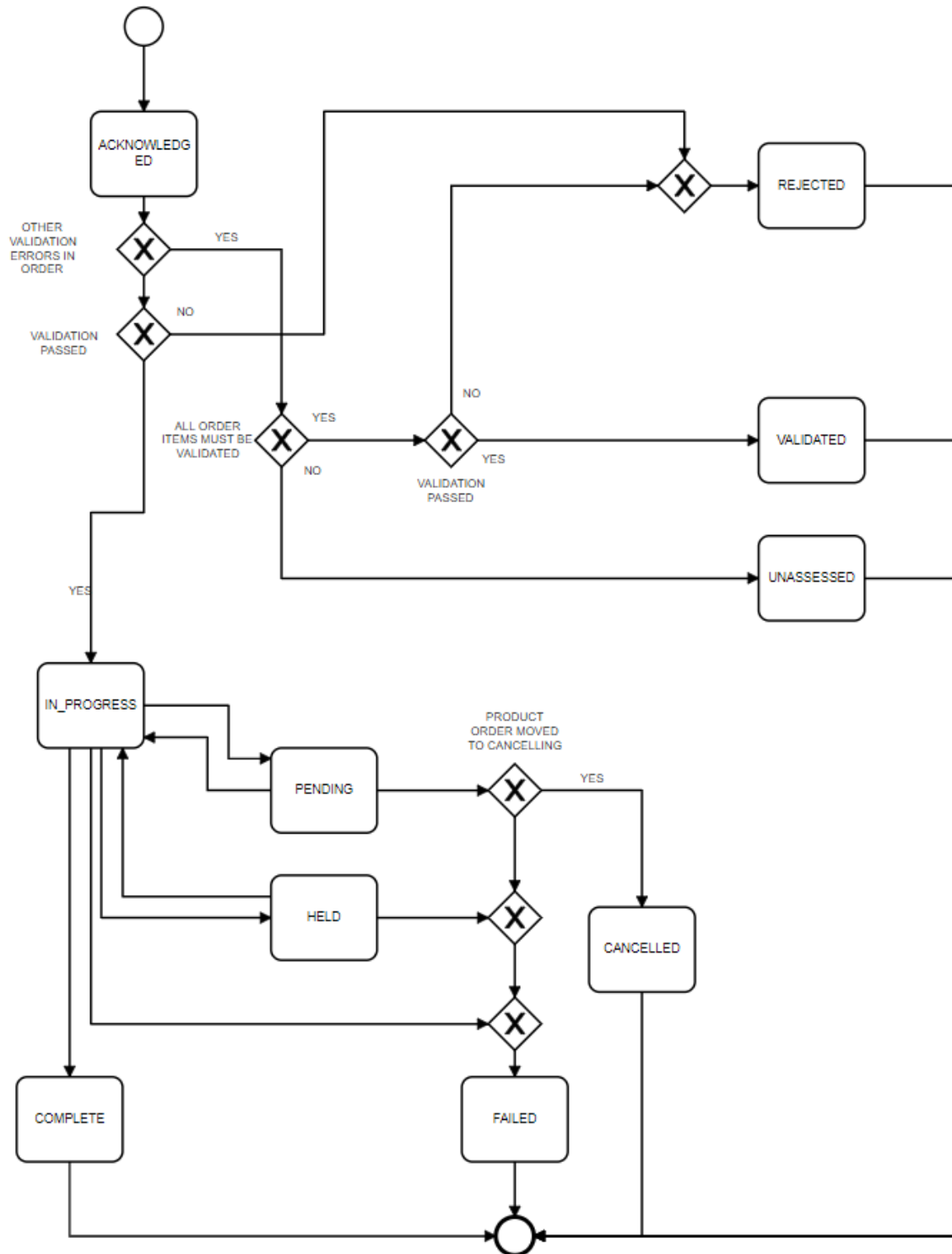


Figure 4 – Sonata Product Order Item Process Flow

State	Description
ACKNOWLEDGED	A Product Order Item has been received and has passed basic business validations. From the ACKNOWLEDGED state the Product Order Item is further validated and depending on the results of the validation and if other Product Order Items in the Product Order are also validated the Product Order Item moves to IN_PROGRESS, VALIDATED, or UNASSESSED.
CANCELLED	The In-Flight Product Order has moved to the CANCELLING state. All Product Order Items move to CANCELLED.
COMPLETED	The Product Order Item has completed provisioning. This is an end state
FAILED	The fulfillment of a Product Order Item has failed. A Product Order Item may fail because the Buyer declined a Blocking charge identified via the Charge, the Buyer failed to respond to a Charge Item included in a Charge, or the Seller is unable to fulfill the Product Order Item. A Product Order Item moving to FAILED state results in the Product Order State being FAILED or PARTIAL. This is a terminal state.
HELD	The Product Order Item cannot be progressed due to Charge the Seller awaiting a response from the Buyer on a Charge. The Seller stops work on the Product Order Item until the Charge has completed, Upon acceptance by the Buyer of all Blocking charges, the Product Order Item returns to IN_PROGRESS state If the Buyer rejects a Blocking charge, the Product Order Item moves to the FAILED state.
IN_PROGRESS	The Product Order Item has been successfully validated and fulfillment has started. If the Seller's system links validation between Product Order Items in a Product Order, a Product Order Item in this state also indicates that the other Product Order Items passed validation.

PENDING	The Product Order Item cannot be progressed due to Charge the Seller assessing a Cancel Product Order or Modify Product Order Item Completion Date request. The Seller stops work on the Product Order Item until either the Cancel Product Order has been accepted and the Product Order state moves to CANCELLING and the Product Order Item state moves to CANCELLED, the Cancel Product Order has been rejected and the Product Order Item State moves to IN_PROGRESS, the Modify Product Order Item Completion Date has been accepted and the Product Order Item State moves to IN_PROGRESS, or the Modify Product Order Item Completion Date moves to DECLINED and the Product Order Item state moves to FAILED. Charge
REJECTED	A Product Order Item was submitted, and it has failed at least one validation checks the Seller performs during the ACKNOWLEDGED state.
UNASSESSED	A Product Order was submitted and all validation checks the Seller performs during the ACKNOWLEDGED state have not completed, but another Product Order Item in the Product Order has moved to the REJECTED state.
VALIDATED	A Product Order was submitted, and it has passed all validation checks the Seller performs during the ACKNOWLEDGED state, but another Product Order Item in the Product Order has moved to the REJECTED state.

Table 60 – Product Order Item Process Flow States

11.3 Modify Product Order Item Date Process State Machine

The States and State Machines of the Modify Product Order Item Completion Date Process are detailed in this section.

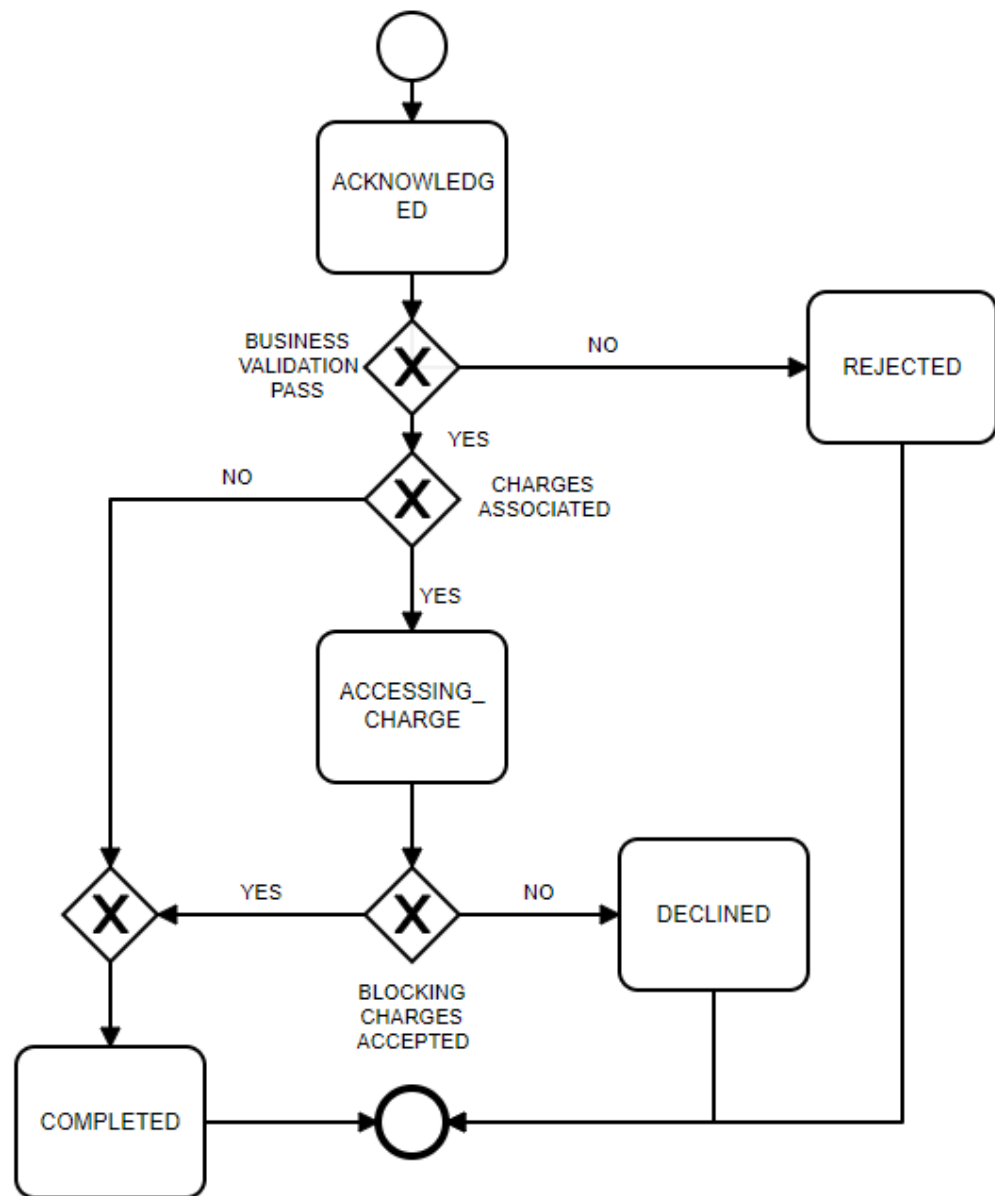


Figure 5 – Modify Product Order Item Completion Date Process Flow

State	Description
ACCESSING_CHARGE	The Modify Product Order Item Completion Date request results in a Charge being initiated by the Seller. The Modify Product Order Item Completion Date remains in this state until the Charge is completed or withdrawn by the Seller. All charges within a Charge that was initiated due to a Modify Product Order Item Completion Date are considered Blocking charges. If any charge is not accepted by the Buyer, the Modify Product Order Item Completion Date moves from the ASSESSING_CHARGE state to the DECLINED state.
ACKNOWLEDGED	A Modify Product Order Item Completion Date request has been received and has passed basic validation. The Modify Product Order Item Completion Date Identifier is assigned in the ACKNOWLEDGED state. Validation of Modify Product Order Item Completion Date attributes as applicable is completed in the ACKNOWLEDGED state.
COMPLETED	A Modify Product Order Item Completion Date request has been received, passed all validations, if a Charge is associated all Charge Items have been accepted by the Buyer, and the Product Order Item Completion Date has been updated as requested.
DECLINED	Blocking charges associated with a Modify Product Order Item Completion Date have been declined by the Buyer. No updates are made to the Product Order Item.
REJECTED	A Modify Product Order Item Completion Date request was submitted by the Buyer, and it has failed any validation checks the Seller performs during the ACKNOWLEDGED state. No updates are made to the referenced Product Order Item.

Table 61 – Modify Product Order Item Completion Date Process Flow States

11.4 Cancel Product Order Process State Machine

The States and State Machines of the Cancel Product Order Process are detailed in this section.

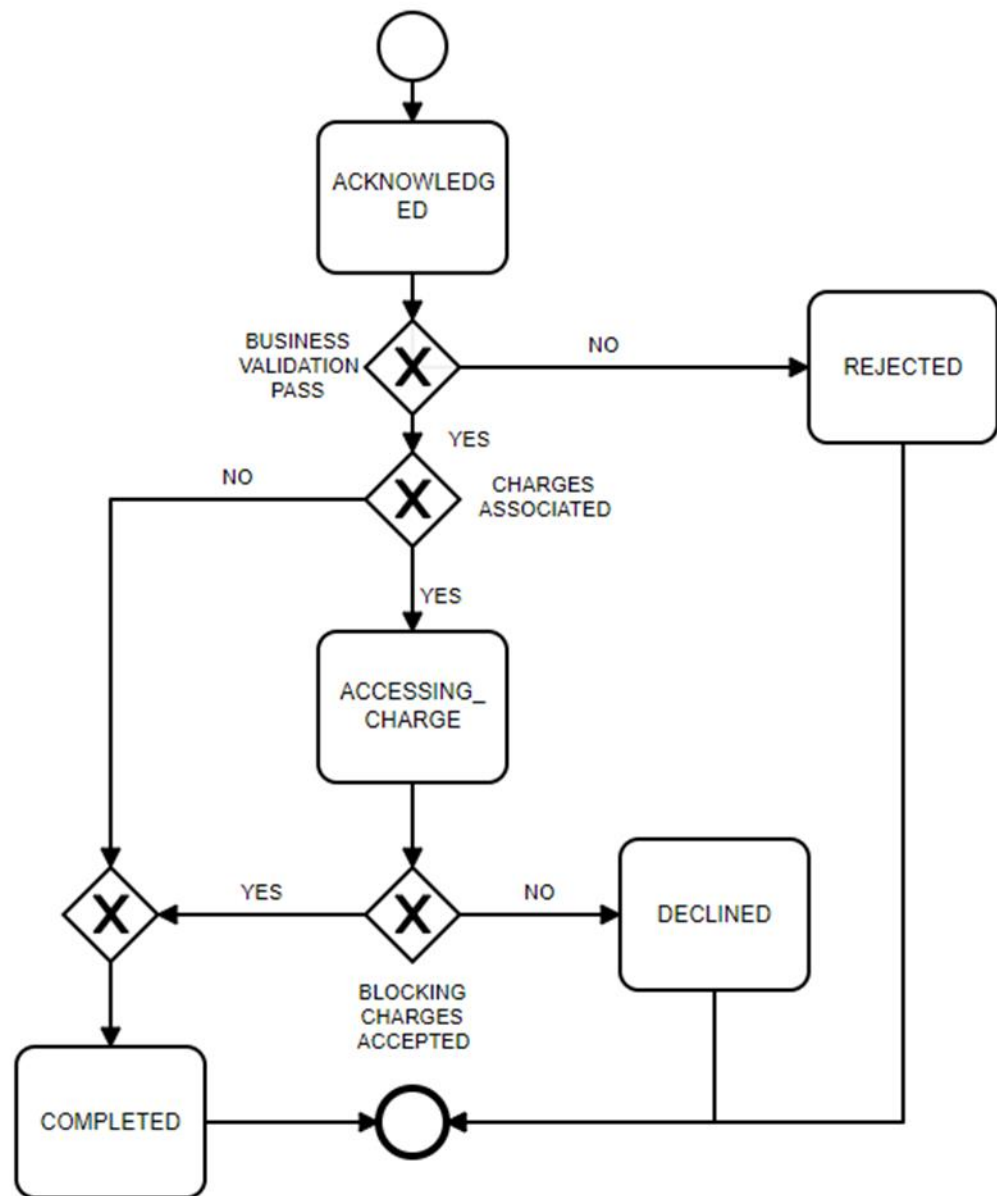


Figure 6 – Cancel Product Order Process Flow

State	Description
ACCEPTED	A Cancel Request has been accepted by the Seller. The referenced Product Order is cancelled.
ACCESSING_CHARGE	The Cancel Request results in a Charge being initiated by the Seller. The Cancel Request remains in this state until the Charge is completed or withdrawn by the Seller.
ACKNOWLEDGED	A Cancel Request has been received and has passed basic validation. Seller Cancel Identifier is assigned in the ACKNOWLEDGED state. Validation of Cancel attributes as applicable are completed in the ACKNOWLEDGED state.
COMPLETED	A Cancel Request has been received, passed all validations, if a Charge is associated all Charge Items have been accepted by the Buyer, and the Product Order has been cancelled as requested.
DECLINED	Blocking charges associated with a Cancel Product Order have been declined by the Buyer. No updates are made to the Product Order.
REJECTED	A Cancel Request was submitted, and it has failed any validation checks the Seller performs during the ACKNOWLEDGED state e.g. the Product Order being in an incorrect state. No updates are made to the referenced Product Order.

Table 62 – Cancel Process Flow States

11.5 Charge State Machines

The States and State Machines of the Charge are detailed in this section.

11.5.1 Charge Process Flow

The States and State Machine for the Charge is detailed in this section.

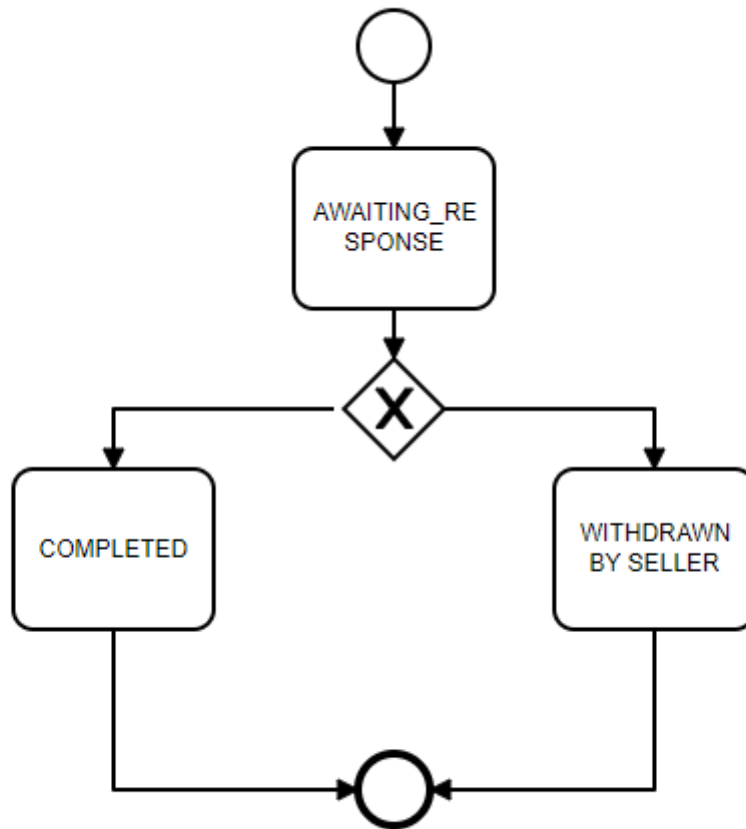


Figure 7 – Charge Process Flow

State	Description
COMPLETED	All Charges included in the Charge for a given Product Order Item have moved to either the ACCEPTED state or the DECLINED state.
AWAITING_RESPONSE	A Charge has been initiated by the Buyer. The Charge includes one or more charges related to a Product Order Item.
WITHDRAWN_BY_SELLER	The Seller determines that the Charge is incorrect. They withdraw the Charge and initiate a new Charge with the required correction(s).

Table 63 – Charge Process Flow States

11.5.2 Charge Item Process States and State Machine

The Charge Item process States and State Machine are detailed in this section.

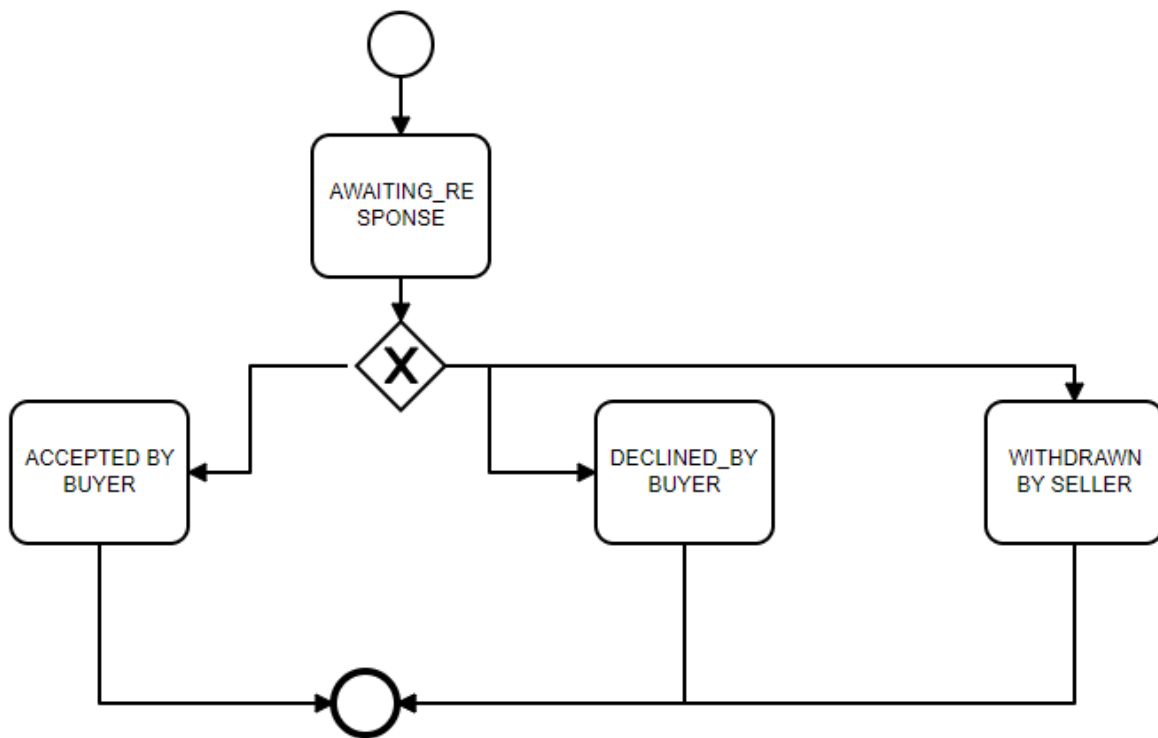


Figure 8 – Charge Item Process

State	Description
ACCEPTED_BY_BUYER	A Charge identified in the Charge has been accepted by the Buyer. The referenced Product Order and Product Order Items are updated.
AWAITING_RESPONSE	A Charge has been initiated by the Buyer. The Charge includes one or more charges related to a Product Order Item.
DECLINED_BY_BUYER	A Charge identified in the Charge has been declined by the Buyer. The referenced Product Order and Product Order Items are updated. If a Blocking charge is declined, the Seller may cancel the referenced Product Order Item and any related Product Order Items.
WITHDRAWN_BY_SELLER	The Seller determines that the Charge is incorrect. They withdraw the Charge and initiate a new Charge with the required correction(s).

Table 64 – Charge Item Process Flow States

12 References

- [1] ATIS-0300253, *Structure for the Representation of Location Entities for Information Exchange*, December 2016
- [2] IETF RFC 2119, *Key words for use in RFCs to Indicate Requirement Levels*, March 1997
- [3] IETF RFC 8174, *Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words*, May 2017
- [4] MEF 50.1, MEF Forum, *MEF Services Lifecycle Process Flows, MEF 50.1*, August 2017.
- [5] MEF 51.1, MEF Forum, *Operator Services Definitions*, December 2018
- [6] MEF 55, MEF Forum, *LSO Reference Architecture*, March 2016.
- [7] MEF 55.0.1, MEF Forum,
- [8] MEF 79, *Address, Service Site, and Product Offering Qualification Management Requirements and Use Cases*, June 2019
- [9] MEF 79.0.2, *Amendment to MEF 79: Address Validation*, September 2020
- [10] MEF 80, *Quote Management Requirements and Use Cases*, Draft Standard, June 2020
- [11] TMF622 TM Forum, *TMF622 Product Ordering API REST Specification R17.5.1*, May 2018.

Appendix A Interactions Between Process Flows

This section provides details on interactions between different process flows shown in section 11. Interactions described include Product Order Item to Product Order, Product Order to Product Order Item, , Cancel Product Order to Product Order and Product Order Item, and Charge to Product Order

A.1 Product Order Item to Product Order Interactions

The process flow state changes at the Product Order level that are the result of state changes at the Product Order Item level are described in this section.

	(T) Product Order Request Submitted	(T+1) Seller Completes Validation of all Product Order Items	(T+2) Product Order Item Completed	(T+3) All Product Order Items Completed
Product Order Item	ACKNOWLEDGED	IN_PROGRESS	COMPLETED	COMPLETED
Other Product Order Items	ACKNOWLEDGED	IN_PROGRESS	IN_PROGRESS	COMPLETED
Product Order	ACKNOWLEDGED	IN_PROGRESS	IN_PROGRESS	COMPLETED

Table 65 – Product Order Item COMPLETED to Product Order State Mapping

	(T) Product Order Request Submitted	(T+1) Seller Completes Validation of all Product Order Items
Product Order Item	ACKNOWLEDGED	REJECTED
Other Product Order Items	ACKNOWLEDGED	VALIDATED
Product Order	ACKNOWLEDGED	REJECTED

Table 66 – Product Order Item REJECTED to Product Order State Mapping

	(T) Product Order Request Submitted	(T+1) Seller Completes Validation of all Product Order Items	(T+2) Product Order Item Failed	(T+3) All Product Order Items Completed
Product Order Item	ACKNOWLEDGED	IN_PROGRESS	FAILED	FAILED
Other Product Order Items	ACKNOWLEDGED	IN_PROGRESS	IN_PROGRESS	COMPLETED
Product Order	ACKNOWLEDGED	IN_PROGRESS	IN_PROGRESS	PARTIAL

Table 67 – One Product Order Item FAILED to Product Order State Mapping

	(T) Product Order Request Submitted	(T+1) Seller Completes Validation of all Product Order Items	(T+2) All Product Order Items Failed
Product Order Item	ACKNOWLEDGED	IN_PROGRESS	FAILED
Other Product Order Items	ACKNOWLEDGED	IN_PROGRESS	FAILED
Product Order	ACKNOWLEDGED	IN_PROGRESS	FAILED

Table 68 – All Product Order Items FAILED to Product Order State Mapping

A.2 Product Order to Product Order Item Interactions

The process flow state changes at the Product Order Item level that are the result of state changes at the Product Order level are described in this section.

	(T) Product Order Request Submitted	(T+1) Seller Completes Validation of all Product Order Items	(T+2) Product Order Completed
Product Order	ACKNOWLEDGED	IN_PROGRESS	COMPLETED
Product Order Item	ACKNOWLEDGED	IN_PROGRESS	COMPLETED
Other Product Order Items	ACKNOWLEDGED	IN_PROGRESS	COMPLETED

Table 69 – Product Order COMPLETED to Product Order Item State Mapping

	(T) Product Order Request Submitted	(T+1) Seller Completes
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		Validation of all Product Order Items
Product Order	ACKNOWLEDGED	REJECTED
Product Order Item	ACKNOWLEDGED	REJECTED
Other Product Order Items	ACKNOWLEDGED	VALIDATED

Table 70 – Product Order REJECTED to Product Order Item State Mapping

	(T) Product Order Request Submitted	(T+1) Seller Completes Validation of all Product Order Items	(T+2) Product Order Item Failed	(T+3) All Product Order Items Completed
Product Order	ACKNOWLEDGED	IN_PROGRESS	IN_PROGRESS	PARTIAL
Failed Product Order Item	ACKNOWLEDGED	IN_PROGRESS	FAILED	FAILED
Other Product Order Items	ACKNOWLEDGED	IN_PROGRESS	IN_PROGRESS	COMPLETED

Table 71 – Product Order PARTIAL to Product Order Item State Mapping

	(T) Product Order Request Submitted	(T+1) Seller Completes Validation of all Product Order Items	(T+2) All Product Order Items Failed
Product Order	ACKNOWLEDGED	IN_PROGRESS	FAILED
Product Order Item	ACKNOWLEDGED	IN_PROGRESS	FAILED
Other Product Order Items	ACKNOWLEDGED	IN_PROGRESS	FAILED

Table 72 – All Product Order Items FAILED to Product Order State Mapping