



MEF Standard

MEF 57.2

Product Order Management Business Requirements and Use Cases

October 2022

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Table of Contents

1	List of Contributing Members	1
2	Abstract	1
3	Terminology and Abbreviations	2
4	Scope	3
5	Compliance Levels	4
6	Introduction	5
6.1	Product Specific Attributes.....	6
7	Product Ordering Use Cases and Business Process Definitions	7
7.1	High Level Use Cases.....	7
7.2	Product Order Use Cases.....	7
7.2.1	Create Product Order Use Cases.....	12
7.2.2	Modify Product Order Item Requested Delivery Date	18
7.2.3	Cancel Product Order.....	23
7.2.4	Charge.....	27
7.2.5	Notification Use Cases.....	37
7.3	Seller and Buyer Interaction for Charges	39
7.3.1	Charge.....	39
7.3.2	Expedite Requested.....	42
7.3.3	Construction Charges.....	42
7.3.4	Connection Charges.....	43
7.3.5	Cancel Product Order Charges.....	43
8	Product Order Operation Attributes	44
8.1	Buyer and Seller Attributes	44
8.2	Product Order Attributes	45
8.2.1	Updatable Product Order Attributes	47
8.3	Product Order Item Attributes	47
8.3.1	Updatable Product Order Item Attributes	52
8.4	Modify Product Order Item Requested Delivery Date Attributes	53
8.5	Cancel Product Order Attributes	54
8.6	Contact Attributes.....	56
8.7	Buyer Billing Attributes	57
8.8	Product Order Item Relationship Attributes	58
8.9	Product Order Item Coordinated Action	58
8.10	Product Relationship Attributes.....	60
8.11	Notification Registration Attributes	60
8.12	Notification Attributes.....	62
8.13	Place Relationship Attributes	63
8.14	Note Attributes	64
8.15	Charge Attributes.....	64
8.16	Charge Item Attributes	66
8.17	Price Attributes	67
8.18	Term Attributes.....	68
8.19	POQ Item Reference Attributes.....	69

8.20	Quote Item Reference Attributes	70
8.21	Duration	70
9	Product Order Requirements	71
9.1	Create Product Order	71
9.1.1	Buyer Create Product Order Request Product Order Level Attributes	71
9.1.2	Create Product Order Seller Create Product Order Initial Response Product Order Level ...	72
9.1.3	Seller Product Order Lifecycle Updates Product Order Level	72
9.1.4	Buyer Create Product Order Product Order Item Common Requirements	73
9.1.5	Seller Create Product Order Initial Response Product Order Item Common Requirements ..	74
9.1.6	Seller Lifecycle Response Product Order Item Common Requirements.....	75
9.1.7	Buyer Create Product Order Product Order Item with Product Action INSTALL	75
9.1.8	Seller Create Product Order Initial Response Product Order Item with Product Action INSTALL	76
9.1.9	Seller Create Product Order Lifecycle Response Product Order Item with Product Action INSTALL	76
9.1.10	Buyer Create Product Order Product Order Item Product Action CHANGE	76
9.1.11	Seller Product Order Lifecycle Response Product Order Item with Product Action CHANGE	77
9.1.12	Buyer Create Product Order Product Order Item Product Action DISCONNECT.....	77
9.1.13	Seller Create Product Order Lifecycle Response with Product Order Item Product Activity DISCONNECT.....	77
9.2	Update Product Order Attributes	77
9.2.1	Buyer Update Product Order Attributes Request.....	77
9.2.2	Seller Update Product Order Attributes by Product Order Identifier Response	78
9.2.3	Buyer Update Product Order Item Attributes Request	78
9.2.4	Seller Update Product Order Item Attributes Response	78
9.3	Modify Product Order Item Requested Delivery Date	79
9.3.1	Modify Expedite Indicator.....	79
9.3.2	Modify Product Order Item Requested Delivery Date	80
9.4	Initiate Charge	81
9.4.1	Initiate Charge.....	81
9.4.2	Charge Contents.....	81
9.4.3	Retrieving Charge.....	83
9.5	Response to Charge	83
9.5.1	No Response Received by Seller	83
9.6	Cancel Product Order Request	83
9.6.1	Buyer Cancel Product Order Request.....	83
9.6.2	Seller Cancel Product Order Response	84
9.7	Retrieve Product Order List.....	84
9.7.1	Buyer Retrieve Product Order List Request	84
9.7.2	Seller Retrieve Product Order List Response	85
9.8	Retrieve Product Order by Product Order Identifier	86
9.8.1	Buyer Retrieve Product Order by Product Order Identifier Request.....	86
9.8.2	Seller Query Product Order by Identifier Response	86
9.9	Retrieve Modify Product Order Item Requested Delivery Date List	89
9.9.1	Buyer Retrieve Modify Product Order Item Requested Delivery Date List Request.....	89
9.9.2	Seller Retrieve Modify Product Order Item Requested Delivery Date List Response.....	89
9.10	Retrieve Modify Product Order Item Requested Delivery Date by Modify Product Order Item Requested Delivery Date Identifier.....	90

9.10.1	Buyer Retrieve Modify Product Order Item Requested Delivery Date by Modify Product Order Item Requested Delivery Date Identifier Request	90
9.10.2	Seller Retrieve Modify Product Order Item Requested Delivery Date by Modify Product Order Item Requested Delivery Date Identifier Response	90
9.11	Retrieve Cancel Product Order List.....	91
9.11.1	Buyer Retrieve Cancel Product Order List Request	91
9.11.2	Seller Retrieve Cancel Product Order List Response	91
9.12	Retrieve Cancel Product Order by Cancel Product Order Identifier	92
9.12.1	Buyer Retrieve Cancel Product Order by Cancel Product Order Identifier Request.....	92
9.12.2	Seller Retrieve Cancel Product Order by Cancel Product Order Identifier Response.....	92
9.13	Retrieve List of Charges	92
9.13.1	Buyer Retrieve List of Charges Request.....	92
9.13.2	Seller Retrieve List of Charges Response.....	93
9.14	Retrieve Charge by Charge Identifier.....	93
9.14.1	Buyer Retrieve Charge by Charge Identifier Charge Request.....	94
9.14.2	Seller Retrieve Charge by Charge Identifier Charge Response.....	94
9.15	Register for Notifications	94
9.15.1	Buyer Register for Notifications Request.....	94
9.15.2	Seller Register for Notification Response.....	95
9.16	Seller Send Notification.....	95
9.17	Specifying the Buyer Identifier and the Seller Identifier	97
10	Product Ordering State Machines.....	98
10.1	Product Order State Machine	98
10.2	Product Order Item State Machine	101
10.3	Modify Product Order Item Requested Delivery Date State Machine	104
10.4	Cancel Product Order State Machine	106
10.5	Charge State Machine.....	108
10.6	Charge Item State Machine	110
11	References.....	112
Appendix A	Process Timelines	113
A.1	Modify Product Order Item Requested Delivery Date	113
A.1.1	Expedite Indicator.....	113
A.1.2	Requested Completion Date	113
A.2	Cancel Product Order	114
A.3	Product Order Item Charge.....	115

List of Figures

Figure 1 – LSO Reference Architecture Diagram	6
Figure 2 – Product Order Use Cases	8
Figure 3 – Cancel Product Order Sequence Diagram	24
Figure 4 – Non-Blocking Charge Sequence	40
Figure 5 – Blocking Charge Sequence Diagram	41
Figure 6 – Product Order Process Flow	99
Figure 7 – Sonata Product Order Item Process Flow	102
Figure 8 – Modify Product Order Item Requested Delivery Date Process Flow	105
Figure 9 – Cancel Product Order Process Flow	107
Figure 10 – Charge Flow	109
Figure 11 – Charge Item Process	111
Figure 12 – Expedite Indicator Impact	113
Figure 13 – Modifying Requested Completion Date Impact	114
Figure 14 – Cancel Product Order Impact	115
Figure 15 – Initiate Charge Impact	116

List of Tables

Table 1 – Terminology and Abbreviations	2
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	16
Table 8 – Retrieve List of Product Orders Use Case	17
Table 9 – Retrieve Product Order by Product Order Identifier Use Case	18
Table 10 – Modify Product Order Item Requested Delivery Date Use Case	19
Table 11 – Modify Product Order Item Requested Delivery Date: Expedite Indicator Use Case	20
Table 12 – Modify Product Order Item Requested Completion Date Use Case	21
Table 13 – Retrieve List of Modify Product Order Item Requested Delivery Dates Use Case....	22
Table 14 – Retrieve Modify Product Order Item Requested Delivery Date by Identifier Use Case	23
Table 15 – Cancel Product Order Use Case.....	25
Table 16 – Retrieve List of Cancel Product Order Requests Use Case	26
Table 17 – Retrieve Cancel Product Order by Cancel Product Order Identifier Use Case	27
Table 18 – Initiate Charge Use Case.....	28
Table 19 – Initiate Charge Associated to Product Order Item Use Case.....	29
Table 20 – Initiate Charge Associated to Modify Product Order Item Requested Delivery Date Use Case.....	30
Table 21 – Initiate Charge Associated to Cancel Product Order Use Case	31
Table 22 – Respond to Charge Use Case.....	31
Table 23 – Respond to Charge Associated to Product Order Item Use Case	33
Table 24 – Respond to Charge Associated to Modify Product Order Item Requested Delivery Date Use Case	34
Table 25 – Respond to Charge Associated to Cancel Product Order Use Case	35
Table 26 – Retrieve List of Charges Use Case	36
Table 27 – Retrieve Charge by Charge Identifier Use Case.....	37
Table 28 – Register for Notifications Use Case.....	38
Table 29 – Send Notification Use Case	38
Table 30 – Use Case to Notification Type Matrix	39
Table 31 – Buyer and Seller Attributes.....	44
Table 32 – Product Order Attributes.....	47
Table 33 – Updatable Product Order Attributes	47
Table 34 – Product Order Item Attributes	52
Table 35 – Updatable Product Order Item Attributes	53
Table 36 – Modify Product Order Item Date Attributes.....	54
Table 37 – Cancel Product Order Attributes.....	55
Table 38 – Contact Attributes	57
Table 39 – Buyer Billing Attributes.....	58
Table 40 – Product Order Item Relationship Attributes	58
Table 41 – Product Order Item Coordination Action Attributes	59
Table 42 – Product Order Item Coordination Dependency	59
Table 43 – Product Relationship Attributes.....	60

Table 44 – Register for Notifications Buyer Attributes.....	61
Table 45 – Seller Notification Attributes.....	62
Table 46 – Place Relationship Attributes.....	63
Table 47 – Note Attributes.....	64
Table 48 – Charge Attributes.....	66
Table 49 – Charge Item Attributes.....	67
Table 50 – Price Attributes.....	68
Table 51 – Term Attributes.....	69
Table 52 – POQ Item Reference Attributes.....	70
Table 53 – Quote Item Reference Attributes.....	70
Table 54 – Duration Attributes.....	71
Table 55 – Price Type Required Information.....	82
Table 56 – Seller Response Product Order Attributes Based on Product Order State.....	87
Table 57 – Seller Response Product Order Item Attributes Based on Product Order State.....	88
Table 58 – Notification Attributes by Notification Type.....	97
Table 59 – Seller Object Identifier to Seller Object Identifier Type.....	97
Table 60 – Product Order Process Flow States.....	101
Table 61 – Product Order Item Process Flow States.....	104
Table 62 – Modify Product Order Item Requested Delivery Date Process Flow States.....	106
Table 63 – Cancel Process Flow States.....	108
Table 64 – Charge Flow States.....	110
Table 65 – Charge Item Process Flow States.....	111

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.

- Amartus
- AT&T
- Bloomberg
- Colt
- Futurewei
- Lumen
- NEC/Netcracker
- Orange
- Proximus
- Spirent
- TELUS
- Verizon

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 55.1 [5], “LSO RA”) requirements for Product Order Management over the Sonata interface (Service Provider ↔ Partner interactions). Business 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 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
Cancellation Charge	A charge set by the Seller that results from the cancellation of a Product Order.	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
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 [9]
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
Monthly Recurring Charge	A charge set by the Seller for the Product that occurs each month.	This document
MRC	Monthly Recurring Charge	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

4 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.

5 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.

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.

6 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] 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 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 7 defines the Use Cases and Product Order Management Scenarios, section 8 defines the specific Product Ordering attributes associated with the Product Orders supported in this document, and section 10 provides the State Diagrams for Product Ordering.

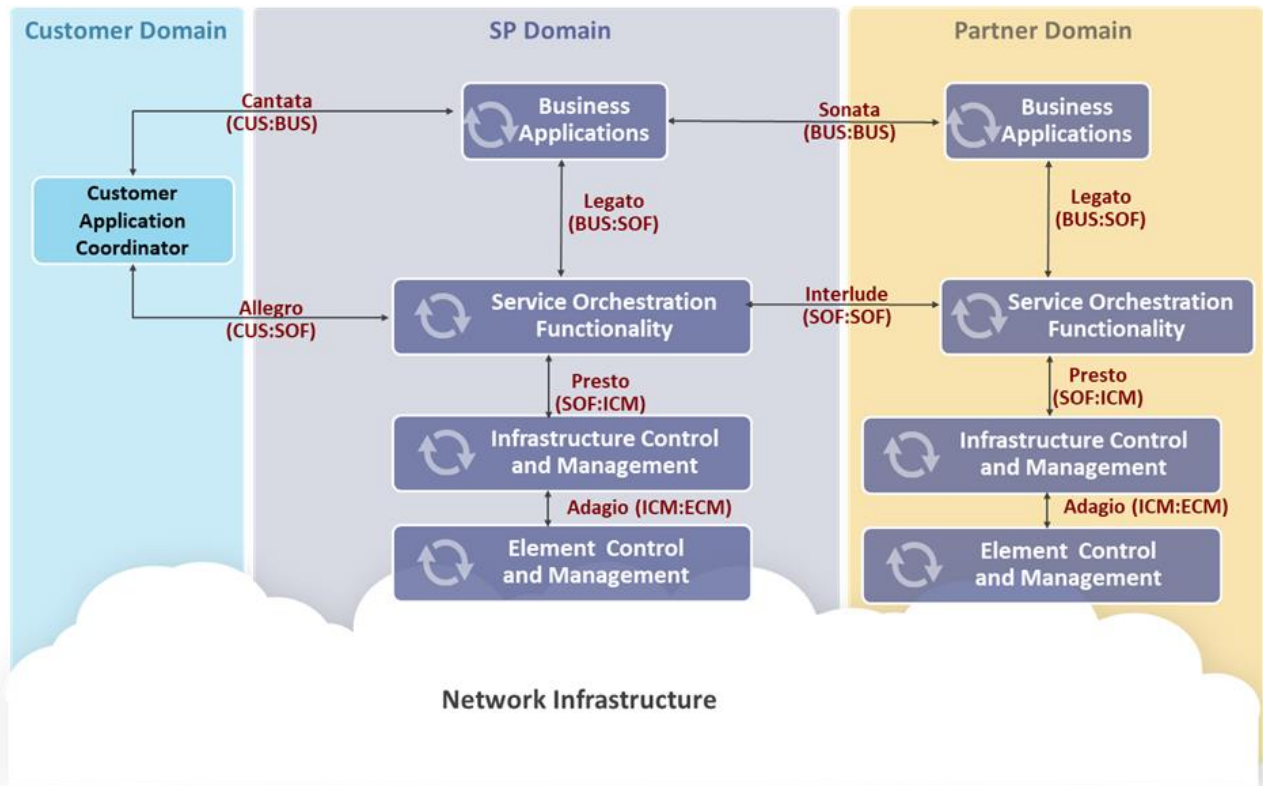


Figure 1 – LSO Reference Architecture Diagram

Figure 1 depicts the LSO Reference Architecture, per MEF 55.1 [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.

6.1 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.

7 Product Ordering Use Cases and Business Process Definitions

7.1 High Level Use Cases

This section provides the complete set of Use Cases needed to support the Product Ordering of Products 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 Service Providers and Partners. 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 8. There are mandatory use cases and optional use cases.

[R1] An implementation of the Product Order API **MUST** support Use Cases 1, 1-a, 1-b, 1-c, 3, and 4.

[O1] An implementation of the Sonata Product Order API **MAY** support Use Cases 2, 5, 5-a, 5-b, 6, 7, 8, 9, 10, 11, 11-a, 11-b, 11-c, 12, 12-a, 12-b, 12-c, 13, 14, 15, and 16.

[CR1]<[O1] If any of Use Cases 5, 5a, 5b, 6, or 7 is supported then Use Cases 5, 5a, 5b, 6, and 7 **MUST** be supported.

[CR2]<[O1] If any of Use Cases 8, 9, or 10 is supported, then Use Cases 8, 9, and 10 **MUST** be supported.

[CR3]<[O1] If any of Use Cases 11, 11a, 11b, 11c, 12, 12a, 12b, 12c, 13, or 14 is supported then Use Cases 11, 11a, 11b, 11c, 12, 12a, 12b, 12c, 13, 14, 15, and 16 **MUST** be supported.

[CR4]<[O1] If either Use Cases 15 or 16 are supported then both Use Cases 15 and 16 **MUST** be supported.

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 available for each Buyer. The requirements for how a catalog is used within the Product Ordering process are outside the scope of this document.

7.2 Product Order 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.

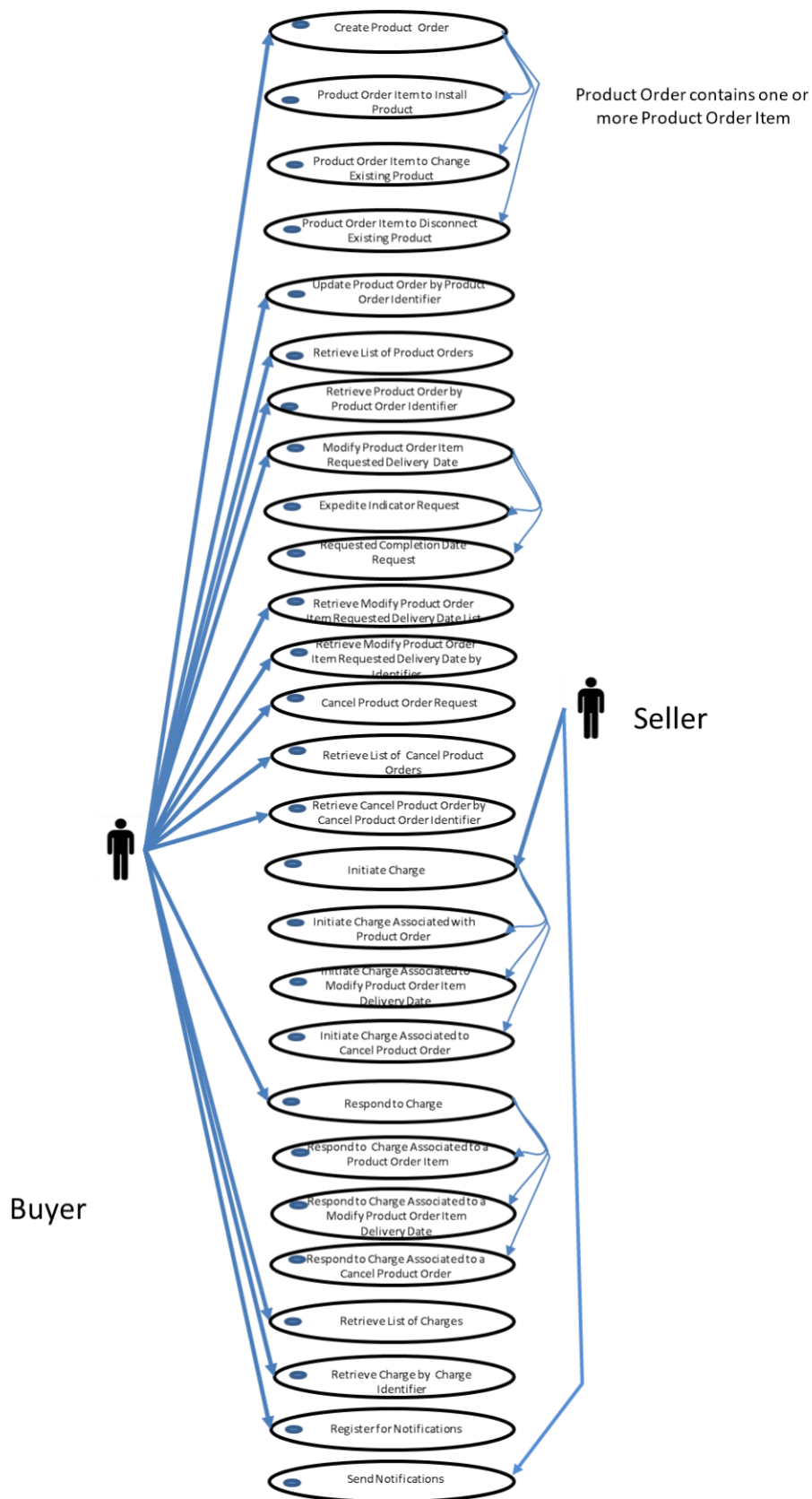


Figure 2 – Product Order Use Cases

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

Use Case #	Use Case Name	Use Case Description	Mandatory or Optional
1	Create Product Order	A request initiated by the Buyer to order a new product. 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.	Mandatory
1-a	Product Order Item to Install Product	Product Order Item with a Product Action of INSTALL	Mandatory
1-b	Product Order Item to Change Existing Product	Product Order Item with a Product Action of CHANGE	Mandatory
1-c	Product Order Item to Disconnect Existing Product	Product Order Item with a Product Action of DISCONNECT	Mandatory
2	Update Product Order by Product Order Identifier	Allows the Buyer to update some Product Order and Product Order Item Attributes which have no impact on the fulfillment process of the Product Order	Optional
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	Mandatory
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.	Mandatory
5	Modify Product Order Item Requested Delivery Date	A request initiated by the Buyer to modify the requested delivery date of a Product Order Item.	Optional
5-a	Modify Expedite Indicator	A request initiated by the Buyer to modify the Expedite Indicator of a Product Order Item.	Optional
5-b	Modify Product Order Item	A request initiated by the Buyer to modify the Requested Completion Date of a Product Order Item.	Optional

Use Case #	Use Case Name	Use Case Description	Mandatory or Optional
	Requested Delivery Date		
6	Retrieve Modify Product Order Item Requested Delivery Date List	A request initiated by the Buyer to retrieve a list of Modify Product Order Item Requested Delivery Date that match the provided filter criteria	Optional
7	Retrieve Modify Product Order Item Requested Delivery Date by Modify Product Order Item Requested Delivery Date Identifier	A request initiated by the Buyer to retrieve the details associated with a specific Modify Product Order Item Requested Delivery Date with the given Modify Product Order Item Requested Delivery Date Identifier.	Optional
8	Cancel Product Order	A request initiated by the Buyer to cancel a Product Order.	Optional
9	Retrieve List of Cancel Product Orders	A request initiated by the Buyer to retrieve a list of Cancel Product Order requests that match the provided filter criteria	Optional
10	Retrieve Cancel Product Order by Cancel Product Order Identifier	A request initiated by the Buyer to retrieve the details associated with a specific Cancel Product Order Identifier.	Optional
11	Initiate Charge	Charges communicated from the Seller to Buyer	Optional
11-a	Initiate Charge Associated to Product Order Item	Charges communicated from Seller to Buyer associated with a specific Product Order Item	Optional
11-b	Initiate Charge Associated to Modify Product Order Item Requested Delivery Date	Charges communicated from Seller to Buyer associated with a specific Modify Product Order Item Requested Delivery Date	Optional

Use Case #	Use Case Name	Use Case Description	Mandatory or Optional
11-c	Initiate Charge Associated to Cancel Product Order	Charges communicated from Seller to Buyer associated with a specific Cancel Product Order	Optional
12	Respond to Charge	A Buyer communicates to the Seller if they Accept or Decline Charge Items within a Charge.	Optional
12-a	Respond to Charge Associated to a Product Order Item	A Buyer communicates to the Seller if they Accept, or Decline Charge Items associated with a Product Order Item	Optional
12-b	Respond to Charge Associated to a Modify Product Order Item Requested Delivery Date	A Buyer communicates to the Seller if they Accept, or Decline Charge Items associated with a Modify Product Order Item Requested Delivery Date	Optional
12-c	Respond to Charge Associated to a Cancel Product Order	A Buyer communicates to the Seller if they Accept, or Decline Charge Items associated with a Cancel Product Order	Optional
13	Retrieve List of Charges	A request initiated by the Buyer to retrieve a list of Charges that match the provided filter criteria	Optional
14	Retrieve Charge by Charge Identifier	A request initiated by the Buyer to retrieve the details associated with a specific Charge with the given Charge Identifier.	Optional
15	Register for Notifications	The Buyer requests to subscribe to notifications for the Use Cases which the Seller supports including Create Product Order, Cancel Product Order, Charges, or Modify Product Order Item Requested Delivery Date.	Optional
16	Send Notification	A notification initiated by the Seller to the Buyer providing subsequent status information on Create Product Order, Cancel Product Order, Modify Product Order Item Requested Delivery Date, and Initiate Charge.	Optional

Table 2 – MEF Product Order Use Case Summary

The subsequent subsections define 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 includes interconnection inventory).
- The rules defining the possible combinations of Product Order Items within a Product Order are defined in Seller Product Order Management system.
- Relationships between Product Offerings are defined in Product Catalog and will be covered in a separate document.

For these Use Cases it is assumed that the Buyer has been on-boarded and authorized to order Products from the Seller, perform queries, update Product Orders, modify Product Order Item Requested Delivery Dates, accept Charges, and Cancel Product Orders.

7.2.1 Create Product Order Use Cases

The following Use Cases are described in this section:

- Create 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 by Product Order Identifier
- Retrieve Product Order List
- Retrieve Product Order by Product Order Identifier

7.2.1.1 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 may have completed pre-Product Order inquiries/serviceability request. 2. 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 attributes in the Create POQ response. The validation of some attributes may be deferred until the fulfillment process (Product Order is IN_PROGRESS). 4. 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 validation of some attributes may be deferred until the fulfillment process (Product Order is IN_PROGRESS). 5. The Seller accepts the Create Product Order request, and the state of the Product Order is set to "ACKNOWLEDGED" by the Seller. 6. The Seller provides a response with an assigned Product Order Identifier.
Post-Conditions	<ol style="list-style-type: none"> 1. The "ACKNOWLEDGED" Product Order is ready for processing including post acknowledgement business rule validation. 2. Seller initiates Product Order processing. 3. If the Seller supports notifications and the Buyer has registered for notifications, the Seller notifies the Buyer of the Product Order Item Expected Completion Date by which the requested product will be delivered. 4. Additional notifications are provided during the life of the Product Order.
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 acknowledging the Product Order

Table 3 – Create New Product Order Request Use Case

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

A Create 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. The Product Actions may be the same or different actions such as Disconnect and Install. 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 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 is set to “ACKNOWLEDGED” by the Seller.

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 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 Product Order request and provides a response with an assigned 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.

There are Use Cases described in this document that address making a change to an existing Product, updating Buyer provided information in a Product Order, and modifying the Requested Completion Date of the Product Order Item. These are distinct Use Cases and should be treated as such.

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 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 Product Order request and Product Order Items. 3. The Seller accepts the Create Product Order request and provides a response with an assigned Product Order Identifier. The state of the Product Order is set to “ACKNOWLEDGED” by the Seller.

Table 6 – Product Order Item to Disconnect Existing Product

7.2.1.2 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 by Product Order Identifier
Description	A request initiated by the Buyer to update Product Order and/or Product Order Item Attributes. The requested update will have no impact on the fulfillment of the Product Order and only allows the Buyer to provide information that could be used by the Buyer or Seller during fulfillment.
Actors	Buyer, Seller
Pre-Conditions	<ol style="list-style-type: none"> 1. The Seller supports update of the Product Order and Product Order Item attributes defined within this document. 2. The Product Order must be in-progress 3. If the Seller is updating a Product Order Item, it must be in-progress.
Process Steps	<ol style="list-style-type: none"> 1. The Buyer submits an Update Product Order request as shown in sections 8.2.1 and 8.3.1, including the Product Order and/or Product Order Item Attributes that are to be updated with the Attribute values. 2. The Seller validates the request. 3. The Seller updates the specified attributes to the new value.

Post-Conditions	1. The specific Product Order and/or Product Order Item Attribute values are updated.
Alternative Paths	1. If errors are encountered, the Seller returns the errors in a reject response. 2. If the Update Product Order request is invalid, the Seller returns an error.

Table 7 – Update Product Order Use Case

Note: Any updates to Notes (Product Order or Product Order Item) are appended as the latest note to the existing list of Notes for the Product Order or Product Order Item.

7.2.1.3 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	
Process Steps	<ol style="list-style-type: none"> 1. The Buyer submits a Retrieve List of Product Order request as shown in section 9.7.1 including filter criteria the Seller should apply. 2. The Seller validates the request. 3. The Seller determines if any Product Orders match the filter criteria in the request. 4. The Seller returns a list of summarized Product Order instances as specified in section 9.7.2
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 4 to obtain detailed information for a specific 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.
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Table 8 – Retrieve List of Product Orders Use Case

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

7.2.1.4 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	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. <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 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 31, Table 32, and Table 34.
Post-Conditions	<ol style="list-style-type: none"> 1. The Buyer has detailed information on the Product Order with the given 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.
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Table 9 – Retrieve Product Order by Product Order Identifier Use Case

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

7.2.2 Modify Product Order Item Requested Delivery Date

The following Use Cases are contained in this section:

- Modify Product Order Item Requested Delivery Date request
 - Modify Expedite Indicator request
 - Modify Product Order Item Requested Delivery Date request
- Retrieve List of Modify Product Order Item Requested Delivery Date
- Retrieve Modify Product Order Item Requested Delivery Date by Modify Product Order Item Requested Delivery Date Identifier

7.2.2.1 *Modify Product Order Item Requested Delivery Date*

The Modify Product Order Item Requested Delivery Date Use Cases and sub-Use Cases are detailed in this section.

Field	Description
Use Case #	5
Use Case Name	Modify Product Order Item Requested Delivery Date
Description	A request initiated by the Buyer to modify the delivery date of a Product Order Item.
Actors	Buyer, Seller

Pre-Conditions	<ol style="list-style-type: none"> 1. A Product Order exists in the Seller’s system. 2. The Buyer is allowed to modify Product Order Items within the Product Order. Buyers may only modify Product Order Items within Product Orders that they initiated.
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 Delivery Date of the Product Order Item cannot be modified and may reject the request. The Seller sets the state of the Modify Product Order Item Requested Delivery Date to REJECTED and returns the referenced Product Order to IN_PROGRESS.

Table 10 – Modify Product Order Item Requested Delivery Date Use Case

Field	Description
Use Case #	5-a
Use Case Name	Modify Expedite Indicator
Description	A request initiated by the Buyer to modify the Expedite Indicator of a Product Order Item.
Process Steps	<ol style="list-style-type: none"> 1. The Buyer initiates a Modify Product Order Item Requested Delivery Date request setting the Expedite Indicator to TRUE or FALSE 2. The Seller validates the Modify Product Order Item Requested Delivery Date request. 3. Seller initiates the Modify Item Requested Delivery Date process, sets the Modify Product Order Item Requested Delivery Date state to ACKNOWLEDGED and the Seller assigns a unique Modify Product Order Item Requested Delivery Date Identifier. 4. The Seller changes the state of the Product Order which contains the Product Order Item to ASSESSING_MODIFICATION and the Product Order Item to PENDING. 5. The Seller notifies the Buyer of any charges resulting from modifying the referenced Product Order while the Modify Product Order Item Requested Delivery Date is in the ASSESSING_CHARGE state. (See Charge as described in section 7.2.4 for details on this). 6. The Charge process is completed, with the Charge Items set to ACCEPTED_BY_BUYER state. 7. The Seller accepts the Modify Product Order Item Requested Delivery Date. The Modify Product Order Item Requested Delivery Date is set to COMPLETED. 8. The Seller updates the Product Order Item Expedite Indicator and the Product Order Item Expedite Accepted Indicator. 9. The Seller sets the referenced Product Order Item and Product Order states to IN_PROGRESS. 10. 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. 2. Any associated charges are identified, are accepted, and a Charge process is completed. 3. The Modify Product Order Item Requested Delivery Date is completed.
Alternative Paths	<ol style="list-style-type: none"> 1. If the Charge Item(s) related to the Expedite Indicator = TRUE is DECLINED by the Buyer, the Seller leaves the Expedite Indicator as is, moves the Modify Product Order Item Requested Delivery Date to DECLINED, returns the Product Order Item to IN_PROGRESS, and returns the Product Order to IN_PROGRESS.

Table 11 – Modify Product Order Item Requested Delivery Date: Expedite Indicator Use Case

Field	Description
Use Case #	5-b
Use Case Name	Modify Product Order Item Requested Delivery Date Request
Description	A request initiated by the Buyer to modify the Requested Completion Date of a Product Order Item.
Process Steps	<ol style="list-style-type: none"> 1. The Buyer initiates a Modify Product Order Item Requested Delivery Date request which includes the modified Product Order Item Requested Completion Date. 2. The Seller validates the Modify Product Order Item Requested Delivery Date request. 3. Seller initiates the Modify Product Item Requested Delivery Date process, sets the Modify Product Order Item Requested Delivery Date state to ACKNOWLEDGED, the Seller assigns a unique Modify Product Order Item Requested Delivery Date 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 Requested Delivery Date is in the ASSESSING_CHARGE state. (See Charge as described in section 7.2.4 for details on this). 5. The Charge process is completed, with the Charge Items set to ACCEPTED_BY_BUYER state. 6. The Seller accepts the Modify Product Order Item Requested Delivery Date. The Modify Product Order Item Requested Delivery Date is set to COMPLETED and Seller updates the Product Order Item Requested Completion Date. 7. The Seller sets the referenced Product Order state to IN_PROGRESS. 8. The Seller continues their work to fulfill the Product Order.
Post-Conditions	<ol style="list-style-type: none"> 1. The Product Order Item Requested Completion Date of the specified Product Order Item is updated.

	<ol style="list-style-type: none"> 2. Any associated charges are identified, and the Charge Process is complete. 3. The Modify Product Order Item Requested Delivery Date is completed.
Alternative Paths	<ol style="list-style-type: none"> 1. If the Charge Item(s) related to the Requested Completion Date are declined by the Buyer, the Seller leaves the Requested Delivery Date as is, moves the Modify Product Order Item Requested Delivery Date to DECLINED, returns the Product Order Item to IN_PROGRESS, and returns the Product Order to IN_PROGRESS.

Table 12 – Modify Product Order Item Requested Completion Date Use Case

7.2.2.2 Retrieve Modify Product Order Item Requested Delivery Date List

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

Field	Description
Use Case #	6
Use Case Name	Retrieve Modify Product Order Item Requested Delivery Date List
Description	A request initiated by the Buyer to retrieve a list of Modify Product Order Item Requested Delivery Dates that match the provided filter criteria.
Actors	Buyer, Seller
Pre-Conditions	
Process Steps	<ol style="list-style-type: none"> 1. The Buyer submits a Retrieve Modify Product Order Item Requested Delivery Date List request as shown in section 9.9 including filter criteria the Seller should apply. 2. The Seller validates the request. 3. The Seller determines if any Modify Product Order Item Requested Delivery Date match the filter criteria in the request. 4. The Seller returns a list of summarized Modify Product Order Item Requested Delivery Date instances as specified in section 9.9.2
Post-Conditions	<ol style="list-style-type: none"> 1. The Buyer has a list of all Modify Product Order Item Requested Delivery Date that match the Buyer’s selection criteria. 2. The Buyer is able to initiate Use Case 7 to obtain detailed information for a specific Modify Product Order Item Requested Delivery 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. The Buyer should submit a new more specific query or • a response that indicates the result is too large and includes a subset of the matching Modify Product Order Item Requested Delivery Date requests. <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 13 – Retrieve List of Modify Product Order Item Requested Delivery Dates Use Case

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

7.2.2.3 Retrieve Modify Product Order Item Requested Delivery Date by Modify Product Order Item Requested Delivery Date Identifier

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

Field	Description
Use Case #	7
Use Case Name	Retrieve Modify Product Order Item Requested Delivery Date by Modify Product Order Item Requested Delivery Date Identifier
Description	A request initiated by the Buyer to retrieve the details of a Modify Product Order Item Requested Delivery Date with the given Identifier. This includes all Modify Product Order Item Requested Delivery Date attributes.
Actors	Buyer, Seller
Pre-Conditions	<ol style="list-style-type: none"> 1. The Buyer knows the Modify Product Order Item Requested Delivery Date Identifier they want to retrieve details on. 2. The Modify Product Order Item Requested Delivery Date Identifier exists in the Seller’s system and the Modify Product Order Item Requested Delivery Date is available for online retrieval. <p>Note: Any Modify Product Order Item Requested Delivery 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 Delivery Date by Modify Product Order Item Requested Delivery Date Identifier request to the Seller using the Modify Product Order Item Requested Delivery Date Identifier. 2. The Seller responds to the Retrieve Modify Product Order Item Requested Delivery Date by Modify Product Order Item Requested Delivery Date Identifier request with the up-to-date view of the Modify Product Order Item Requested Delivery Date as shown in section 9.10.2.

Post-Conditions	1. The Buyer has detailed information on the Modify Product Order Item Requested Delivery Date with the given Modify Product Order Item Requested Delivery 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 Requested Delivery 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 Requested Delivery Date, the Buyer must receive a response indicating this. 4. If the Seller has archived a Modify Product Order Item Requested Delivery 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 Requested Delivery Date.

Table 14 – Retrieve Modify Product Order Item Requested Delivery Date by Identifier Use Case

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

7.2.3 Cancel Product Order

The following Use Cases are contained in this section:

- Cancel Product Order
- Retrieve List of Cancel Product Orders
- Retrieve Cancel Product Order by Cancel Product Order Identifier

A sequence flow of events when the Buyer requests a Product Order be cancelled is shown in Figure 3.

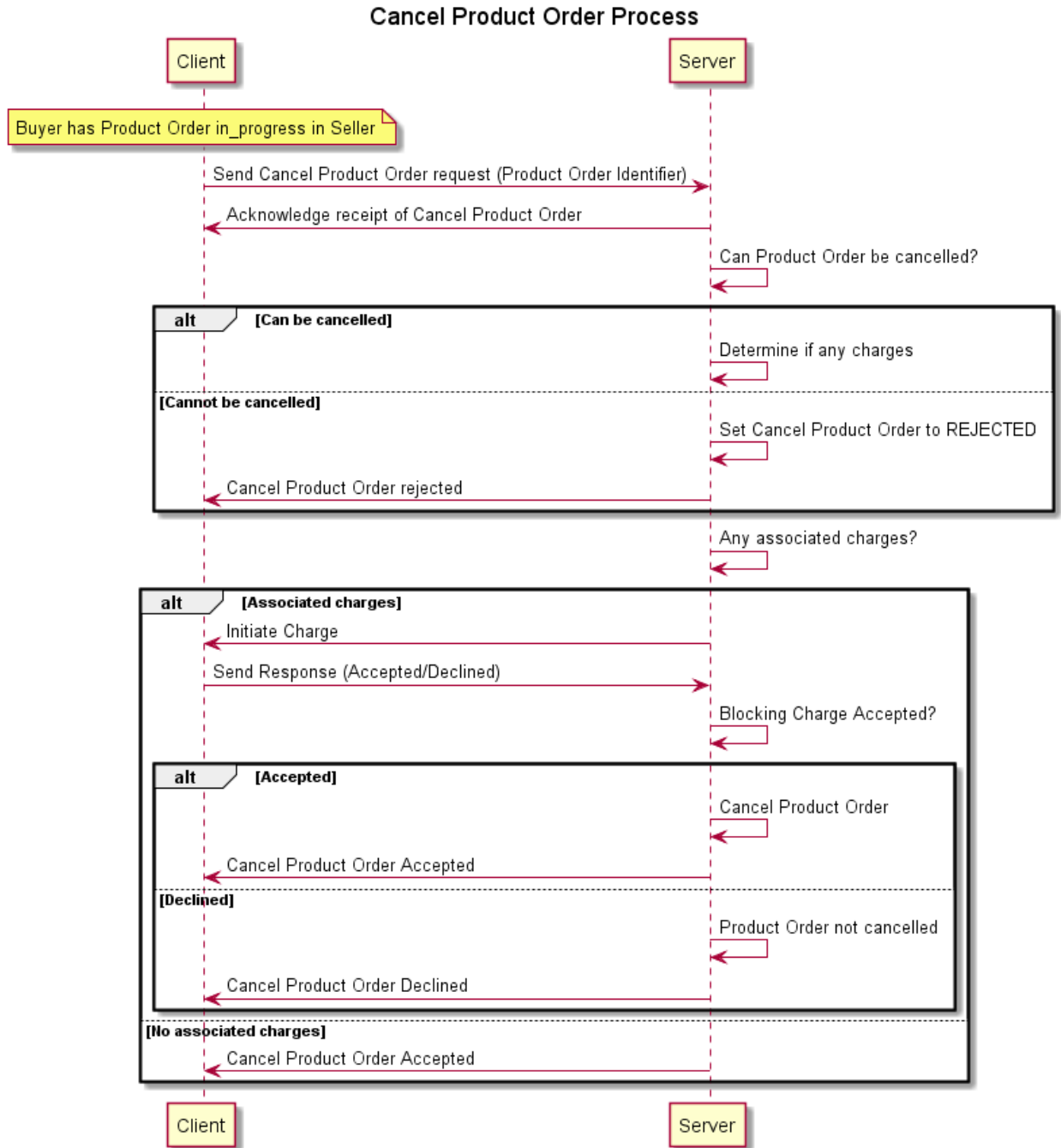


Figure 3 – Cancel Product Order Sequence Diagram

7.2.3.1 Cancel Product Order Use Case

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

Field	Description
Use Case #	8

Use Case Name	Cancel Product Order
Description	A request initiated by the Buyer to cancel a Product Order.
Actors	Buyer, Seller
Pre-Conditions	<ol style="list-style-type: none"> 1. A Product Order exists in the Seller’s system. 2. The Buyer knows the Product Order Identifier of the Product Order they want to cancel 3. The Buyer is allowed to 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 Product Order request. 2. The Seller validates the Cancel Product Order request. 3. Seller initiates the Cancel process and sets the Cancel Product Order state to ACKNOWLEDGED. 4. The Seller assigns a Cancel Product Order Identifier while the Cancel Product Order is in the ACKNOWLEDGED state. 5. The Seller changes the state of the referenced Product Order to ASSESSING_CANCELLATION. The Product Order Item(s) move to PENDING. 6. The Seller notifies the Buyer of any charges resulting from cancelling the referenced Product Order while the Cancel Product Order is in the ASSESSING_CHARGE state. (See Charge as described in section 7.2.4 for details on this). 7. If initiated by the Seller any Charge is completed and the Buyer accepts any Charge Items. 8. The Seller accepts the Cancel Product Order. The Cancel Product Order is set to ACCEPTED and the referenced Product Order state is set to CANCELLING. 9. Once the Seller has completed the Product Order cancellation process, the state of the referenced Product Order is changed to CANCELLED.
Post-Conditions	<ol style="list-style-type: none"> 1. The Product Order is cancelled.
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 cannot be cancelled and may reject the request. The Seller sets the state of the Cancel Product Order to REJECTED and returns the referenced Product Order to IN_PROGRESS. 3. If the Seller initiates a Charge process related to the Cancel Product Order and the Buyer declines the associated Charge Item(s), the Charge is moved to the COMPLETED state, the Cancel Product Order state is set to DECLINED, and the referenced Product Order state is set to IN_PROGRESS.

Table 15 – Cancel Product Order Use Case

7.2.3.2 Retrieve Cancel Product Order List

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

Field	Description
Use Case #	9
Use Case Name	Retrieve List of Cancel Product Orders
Description	A request initiated by the Buyer to retrieve a list of Cancel Product Orders that match the provided filter criteria.
Actors	Buyer, Seller
Pre-Conditions	
Process Steps	<ol style="list-style-type: none"> 1. The Buyer submits a Retrieve List of Cancel Product Orders as shown in section 9.11.1 based on the filter criteria options. 2. The Seller validates the request. 3. The Seller determines if there are any Cancel Product Orders that match the filter criteria in the request. 4. The Seller returns a list of summarized Cancel Product Order instances as specified in section 9.11.2
Post-Conditions	<ol style="list-style-type: none"> 1. The Buyer receives the appropriate response and is aware of any Cancel Product Orders that match the filter criteria. 2. The Buyer may initiate Use Case 10 to obtain detailed information on a Cancel 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 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 Cancel Product Orders. 3. If the query does not find any matching records, then the Seller will respond with an indication of this result.

Table 16 – Retrieve List of Cancel Product Order Requests Use Case

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

7.2.3.3 Retrieve Cancel Product Order by Cancel Product Order Identifier

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

Field	Description
Use Case #	10
Use Case Name	Retrieve Cancel Product Order by Cancel Product Order Identifier
Description	A request initiated by the Buyer to retrieve a Cancel Product Order by Identifier
Actors	Buyer, Seller
Pre-Conditions	1. The Buyer knows the Cancel Product Order Identifier
Process Steps	<ol style="list-style-type: none"> 1. The Buyer initiates a Retrieve Cancel Product Order by Cancel Product Order Identifier request to the Seller using the Seller's assigned Cancel Product Order Identifier. 2. The Seller validates the Buyer's request. 3. The Seller responds to the Retrieve Cancel Product Order by Cancel Product Order Identifier request with the up-to-date view of the Cancel Product Order as specified in 9.12.2.
Post-Conditions	1. The Buyer has detailed information on the specified Cancel 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 Cancel Product Order Identifier is not found, the Buyer must receive a reject response. 3. If the Seller has archived a Cancel Product Order after reaching a final state, the Seller may return an error since the Cancel Product Order is no longer able to be retrieved.

Table 17 – Retrieve Cancel Product Order by Cancel Product Order Identifier Use Case

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

7.2.4 Charge

The following Use Cases are contained in this section:

- Initiate Charge
 - Initiate Charge Associated to a Product Order Item
 - Initiate Charge Associated to Modify Product Order Item Requested Delivery Date
 - Initiate Charge Associated to Cancel Product Order

- Respond to Charge
 - Respond to Charge Associated to a Product Order Item
 - Respond to Charge Associated to Modify Product Order Item Requested Delivery Date
 - Respond to Charge Associated to a Cancel Product Order
- Retrieve List of Charges
- Retrieve Charge by Charge Identifier

7.2.4.1 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 Requested Delivery Date, or Cancel Product Order. This is the result of the Seller identifying one or more charges associated with the Product Order Item, Modify Product Order Item Requested Delivery Date, or Cancel Product Order.
Actors	Buyer, Seller
Pre-Conditions	1. The Seller identifies a charge that is not yet known to the Buyer.

Table 18 – Initiate Charge Use Case

The charges indicated for a Product Order Item are either in addition to charges provided in a Quote or reflect changes to the pricing provided in a Quote. Since obtaining a Quote is not mandated for Buyers, all charges associated with a Product Order Item may be included in the Charge.

7.2.4.1.1 Initiate Charge Associated to Product Order Item Use Case

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

Field	Description
Use Case #	11-a
Use Case Name	Initiate Charge Associated to Product Order Item

Description	The sub-Use Case does not include Modify Product Order Item Requested Delivery Date or Cancel Product Order charges but is associated with cases in which the Seller detects additional charges or changes in previously communicated charges linked to the fulfillment of the Product Order Item
Process Steps	<ol style="list-style-type: none"> 1. The Seller identifies one or more charges as specified in section 9.4.1 associated with a Product Order Item. A Charge is initiated by the Seller and a CHARGE_CREATE notification is sent by the Seller. The referenced Product Order Item moves to the HELD state. 2. The Buyer receives the CHARGE_CREATE notification, queries the Charge for details.
Post-Conditions	<ol style="list-style-type: none"> 1. Buyer is aware of Charge linked to one Product Order Item 2. A Charge in status AWAITING_RESPONSE exists and is awaiting Acceptance / Decline of identified Charge 3. Product Order Item is in state HELD and execution of the Product Order Item is paused.
Alternative Paths	<ol style="list-style-type: none"> 1. 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. 2. If the Seller identifies errored, or additional charges for a Product Order Item, they may withdraw the Charge Items and related Charge that is in the AWAITING_RESPONSE state and notify the Buyer of the Charge state change. A new Charge may be initiated by the Seller including any updated charges. The Seller may not withdraw a Charge that is not in the AWAITING_RESPONSE state. Any withdrawn Charge and Charge Items are not included as Related Charges for the Product Order Item.

Table 19 – Initiate Charge Associated to Product Order Item Use Case

7.2.4.1.2 Initiate Charge Associated to Modify Product Order Item Requested Delivery Date Use Case
The Initiate Charge Use Case when the Charge is associated with a Modify Product Order Item Requested Delivery Date is shown in this section.

Field	Description
Use Case #	11-b
Use Case Name	Initiate Charge Associated to Modify Product Order Item Requested Delivery Date
Description	This sub-Use Case does not include Product Order or Cancel Product Order charges but describes charges due to a request to change the Expedite Indicator for a Product Order Item or change the Product Order Item Requested Completion Date.
Process Steps	<ol style="list-style-type: none"> 1. The Seller identifies one or more charges as specified in section 9.4.1 associated with a Modify Product Order Item Requested Delivery Date. A Charge is initiated by the Seller and a CHARGE_CREATE notification is sent by the Seller. The referenced Modify Product Order Item Requested Delivery Date moves to the ASSESSING_CHARGE state until a response is received from the Buyer or the

	<p>request for information expires, and a Modify Product Order Item Requested Delivery Date State Change notification is sent by the Seller.</p> <ol style="list-style-type: none"> The Buyer receives the CHARGE_CREATE notification, a Modify Product Order Item Requested Delivery Date State Change notification if subscribed, queries the Charge for details.
Post-Conditions	<ol style="list-style-type: none"> The Buyer has the charges identified by the Seller. A Charge in status AWAITING_RESPONSE exists and is awaiting Acceptance / Decline of identified Charge Product Order Item is in state PENDING and execution of the Product Order Item is paused.
Alternative Paths	<ol style="list-style-type: none"> 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. If the Seller identifies errored or additional charges for a Modify Product Order Item Requested Delivery Date, they may withdraw the Charge that is in the AWAITING_RESPONSE state and notify the Buyer of the Charge state change. A new Charge may be initiated by the Seller including the updated charges. The Seller may not withdraw a Charge that is not in the AWAITING_RESPONSE state. Any withdrawn Charge and Charge Items are not included as Related Charges for the Product Order Item.

Table 20 – Initiate Charge Associated to Modify Product Order Item Requested Delivery Date Use Case

7.2.4.1.3 Initiate Charge Associated to Cancel Product Order Use Case

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

Field	Description
Use Case #	11-c
Use Case Name	Initiate Charge Associated to Cancel Product Order
Description	This sub-Use Case does not include Product Order Item or Modify Product Order Item Requested Delivery Date charges but handles the scenario in which there are costs associated to the cancellation of a Product Order
Process Steps	<ol style="list-style-type: none"> The Seller identifies one or more charges as specified in section 9.4.1 associated with a Cancel Product Order. A Charge is initiated by the Seller and a CHARGE_CREATE 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. The Buyer receives the CHARGE_CREATE notification, Cancel Product Order State Change notification if subscribed, or queries the Cancel Product Order by

	Cancel Product Order Identifier and receives any Charges associated with Cancel Product Order.
Post-Conditions	<ol style="list-style-type: none"> 1. The Buyer has the charges identified by the Seller. 2. A Charge in status Awaiting_Response exists and is awaiting Acceptance / Rejection of identified Charge 3. Cancel Product Order is in state Assessing_Charge. 4. All Product Order Items are in state Pending and execution of the Product Order Item is paused.
Alternative Paths	<ol style="list-style-type: none"> 1. 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. 2. If the Seller identifies errored or additional charges for a Cancel Product Order, they may withdraw the Charge that is in the Awaiting_Response state and notify the Buyer of the Charge state change. A new Charge may be initiated by the Seller including the updated charges. The Seller may not withdraw a Charge that is not in the Awaiting_Response state. Any withdrawn Charge and Charge Items are not included as Cancel Product Order Charge for the Product Order.

Table 21 – Initiate Charge Associated to Cancel Product Order Use Case

7.2.4.2 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 DECLINED for each Charge Item.
Actors	Buyer, Seller
Pre-Conditions	A Charge has been initiated by the Seller.
Post-Conditions	<ol style="list-style-type: none"> 1. The Buyer and Seller have agreed to the charges that will be accepted, that will be declined, and the Product Order can be updated with the charges. 2. The Charge is in a terminal state, cannot be updated by the Seller and cannot be withdrawn by the Seller.

Table 22 – Respond to Charge Use Case

7.2.4.2.1 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 #	12-a
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 DECLINED for each and every Charge Item included in the Charge.2. Seller validates the Buyer's request.3. If the Buyer accepts all of the Charge Items in the Charge, the Seller changes the state of the Charge to COMPLETED.4. The Seller updates the Product Order Item with the accepted charges, changes the referenced Product Order Item state to IN_PROGRESS, and changes the Product Order from ASSESSING_CHARGE to IN_PROGRESS.

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 declines a Charge Item for a charge that is not identified as a Blocking charge, the Seller changes the state of the Charge to COMPLETED and changes the referenced Product Order Item state to IN_PROGRESS. Any Charge containing all declined Charge Items is not included as Related Charges for the Product Order Item. 3. If the Buyer declines a Charge Item that is identified as a Blocking charge, the Seller changes the state of the Charge to COMPLETED, 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. Any declined Charge Items are not included as Related Charges for the Product Order Item. 4. If the Buyer declines a Blocking charge but accepts additional non-Blocking charges related to the Product Order Item, the Seller returns an error. 5. If the Buyer's response does not include a response for each and every Charge Item, the Seller returns an error. 6. If the Buyer responds to a Charge that is already in the COMPLETED state, the Seller returns an error. 7. If the Buyer responds to a Charge that has been withdrawn, the Seller returns an error.
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Table 23 – Respond to Charge Associated to Product Order Item Use Case

7.2.4.2.2 Respond to Charge Associated to Modify Product Order Item Requested Delivery Date Use Case

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

Field	Description
Use Case #	12-b
Use Case Name	Respond to Charge Associated to Modify Product Order Item Requested Delivery Date
Process Steps	<ol style="list-style-type: none"> 1. The Buyer responds to the Charge with either an ACCEPTED or DECLINED for each and every Charge Item included in the Charge. 2. If the Buyer accepts all the charges, the Seller changes the state of the Charge to COMPLETED and changes the referenced Modify Product Order Item Requested Delivery Date state to COMPLETED. 3. The Seller updates the Product Order Item referenced in the Modify Product Order Item Requested Delivery Date with the Charge and with the appropriate date changes.

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 that is considered as a Blocking charge (all Charge Items associated to a Modify Product Order Item Requested Delivery Date are Blocking charges) within a Charge, the Seller changes the state of the Charge to COMPLETED, changes the referenced Modify Product Order Item Requested Delivery Date state to DECLINED. The dates for the Product Order Item referenced in the Modify Product Order Item Requested Delivery Date stay the same but the Product Order Item moves into the IN_PROGRESS state. Any declined Charge Items are not included as Related Charges for the Product Order Item. 3. If the Buyer’s response does not include a response for each and every Charge Item, the Seller returns an error. 4. If the Buyer responds to a Charge that is already in the COMPLETED state, the Seller returns an error. 5. If the Buyer responds to a Charge that has been withdrawn, the Seller returns an error.
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Table 24 – Respond to Charge Associated to Modify Product Order Item Requested Delivery Date Use Case

7.2.4.2.3 Respond to Charge Associated to Cancel Product Order Use Case

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

Field	Description
Use Case #	12-c
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 all the charges, the Seller changes the state of the Charge to COMPLETED, changes the referenced Cancel Product Order state to COMPLETED, and moves the Product Order to CANCELLING state. 3. Any charges associated with cancelling the Product Order are assigned to the Product Order Cancel Product Order Charge
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 that is identified as a Blocking charge (all charges associated to a Cancel Product Order are considered Blocking charges), the Seller changes the state of the Charge to COMPLETED, changes the referenced Cancel Product Order state to DECLINED. The Product Order state is moved to IN_PROGRESS. Any Charge containing declined Charge Items are not included as Cancel Product Order Charge for the Product Order.

	<ol style="list-style-type: none"> 3. If the Buyer’s response does not include a response for each and every Charge Item, the Seller returns an error. 4. If the Buyer responds to a Charge that is already in the COMPLETED state, the Seller returns an error. 5. If the Buyer responds to a Charge that has been withdrawn, the Seller returns an error.
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Table 25 – Respond to Charge Associated to Cancel Product Order Use Case

7.2.4.3 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	
Process Steps	<ol style="list-style-type: none"> 1. The Buyer submits a Retrieve List of Charges request as shown in section 9.13.1 based on the filter criteria options. 2. The Seller 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 9.13.2.
Post-Conditions	<ol style="list-style-type: none"> 1. The Buyer has a list of all Charges that match the Buyer’s selection criteria. 2. The Buyer may initiate Use Case 14 to obtain detailed information on a Charge via the 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.
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Table 26 – Retrieve List of Charges Use Case

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

7.2.4.4 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 the details of a Charge using the Charge Identifier. This includes all Charge and Charge Item attributes
Actors	Buyer, Seller
Pre-Conditions	
Process Steps	<ol style="list-style-type: none"> 1. The Buyer initiates a Retrieve Charge by Charge Identifier request to the Seller using the Charge Identifier. 2. The Seller responds to the Retrieve Charge by Charge Identifier with the latest view of the Charge as shown in 9.14.2.
Post-Conditions	<ol style="list-style-type: none"> 1. The Buyer has detailed information on the Charge identified by the 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 Charge Identifier is not found, the Buyer must receive a response indicating this. 3. If the Seller has archived a Charge after reaching a final state, the Seller may return an error because it is no longer possible to retrieve the Charge.
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Table 27 – Retrieve Charge by Charge Identifier Use Case

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

7.2.5 Notification Use Cases

The following Use Cases are contained in this section:

- Register for Notifications
- Send Notification

7.2.5.1 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 specified notifications
Actors	Buyer, Seller
Pre-Conditions	<ol style="list-style-type: none"> 1. The Seller supports notifications.
Process Steps	<ol style="list-style-type: none"> 1. The Buyer sends the Register for Notifications request as shown in section 9.15.1 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. 3. The Seller records which notifications to send and where to send such notifications for this Buyer. 4. The Seller returns an acknowledgement to the Buyer as shown in section 9.15.2
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 16 in Table 29.
Alternative Paths	The Seller returns an error message if an error is encountered while processing that prevents the Seller from completing the request.

Table 28 – Register for Notifications Use Case

Note: Support by the Seller for the CHARGE_CREATE Notification Type is mandatory. Subscription to the CHARGE_CREATE Notification Type by the Buyer is mandatory.

7.2.5.2 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	A notification initiated by the Seller to the Buyer providing subsequent status information
Actors	Buyer, Seller
Pre-Conditions	<ol style="list-style-type: none"> 1. The Seller supports notifications. 2. The Buyer has subscribed to Notifications.
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 9.16.
Post-Conditions	<ol style="list-style-type: none"> 1. The Seller has sent related notification.
Alternative Paths	<ol style="list-style-type: none"> 1. 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.

Table 29 – Send Notification Use Case

Table 30 details the Notification Types that are supported for the Use Cases in this document. An X indicates that the Notification Type is supported for that Use Case. A blank indicates that none of the Notification Types are supported for that Use Case.

Use Case	State Change	Milestone	Create
1	X	X	
1-a	X	X	
1-b	X	X	
1-c	X	X	
2			
3			
4			
5	X		

Use Case	State Change	Milestone	Create
5-a	X		
5-b	X		
6			
7			
8	X		
9			
10			
11	X		X
11-a	X		
11-b	X		
11-c	X		
12			
12-a	X		
12-b	X		
12-c	X		
13			
14			
15			
16			

Table 30 – Use Case to Notification Type Matrix

7.3 Seller and Buyer Interaction for Charges

Within the Product Order process (Create Product Order, Modify Product Order Item Requested Delivery Date, and Cancel Product Order) interactions detailed as sub-Use Cases between the Buyer and Seller may be required to handle requests from the Buyer which influence the Product Order process or allow the Seller to communicate on changes in the cost by the Seller. The different sub-processes supported are described in the subsequent sub-sections.

7.3.1 Charge

When new non-recurring or changes on recurring or usage-based charges are identified by the Seller during their processing of a Product Order, or Blocking charges are identified when processing a Modify Product Order Item Requested Delivery Date or a Cancel Product Order, the Seller must communicate these charges to the Buyer and the Buyer must respond to the Seller informing the Seller if they accept or decline each charge. This is done using the Charge.

Within the Charge, the Seller indicates for each Charge Item, if the charge is Blocking or non-Blocking. The Seller puts the Product Order associated with the Charge into ASSESSING_CANCELATION state in the case of a Cancel Product Order or Product Order Item associated with the Charge in a HELD state in the case of a Product Order Item or Modify Product Order Item Requested Delivery Date and awaits a response from the Buyer. If the Buyer rejects a Blocking Charge for a Product Order Item, the Seller will cancel that Product Order Item and any related Product Order Items. If the Buyer rejects a Blocking Charge for Cancel Product Order or Modify Product Order Item Requested Delivery Date the Seller does not complete the requested

action instead continuing to fulfill the Product Order. If the Buyer rejects a non-Blocking Charge Item, the Seller proceeds with fulfillment of the Product Order Item.

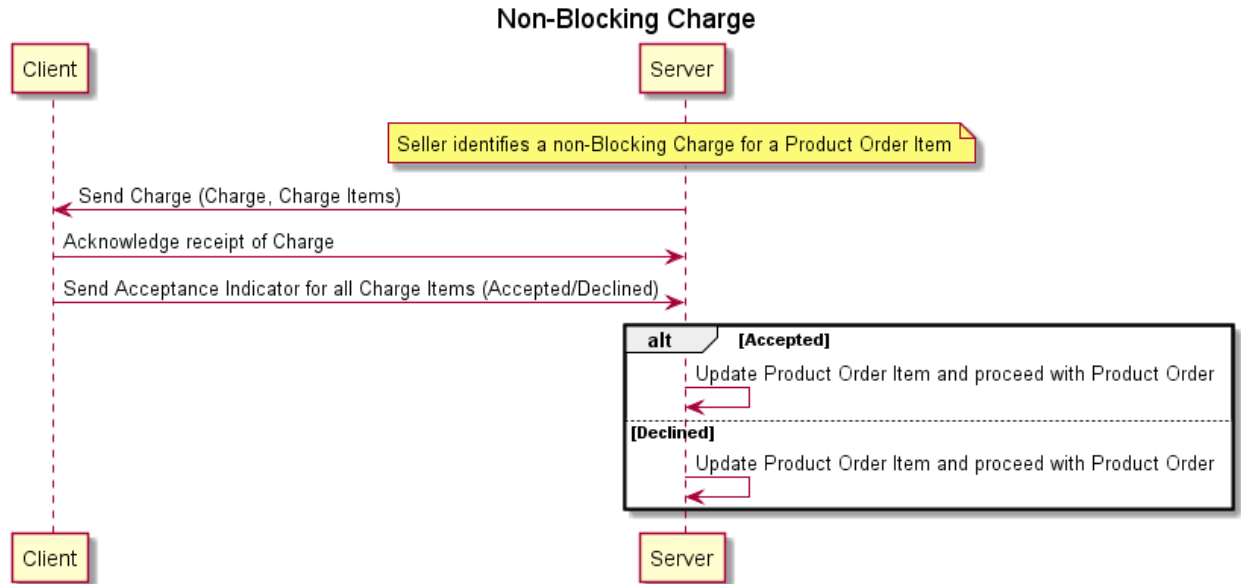


Figure 4 – Non-Blocking Charge Sequence

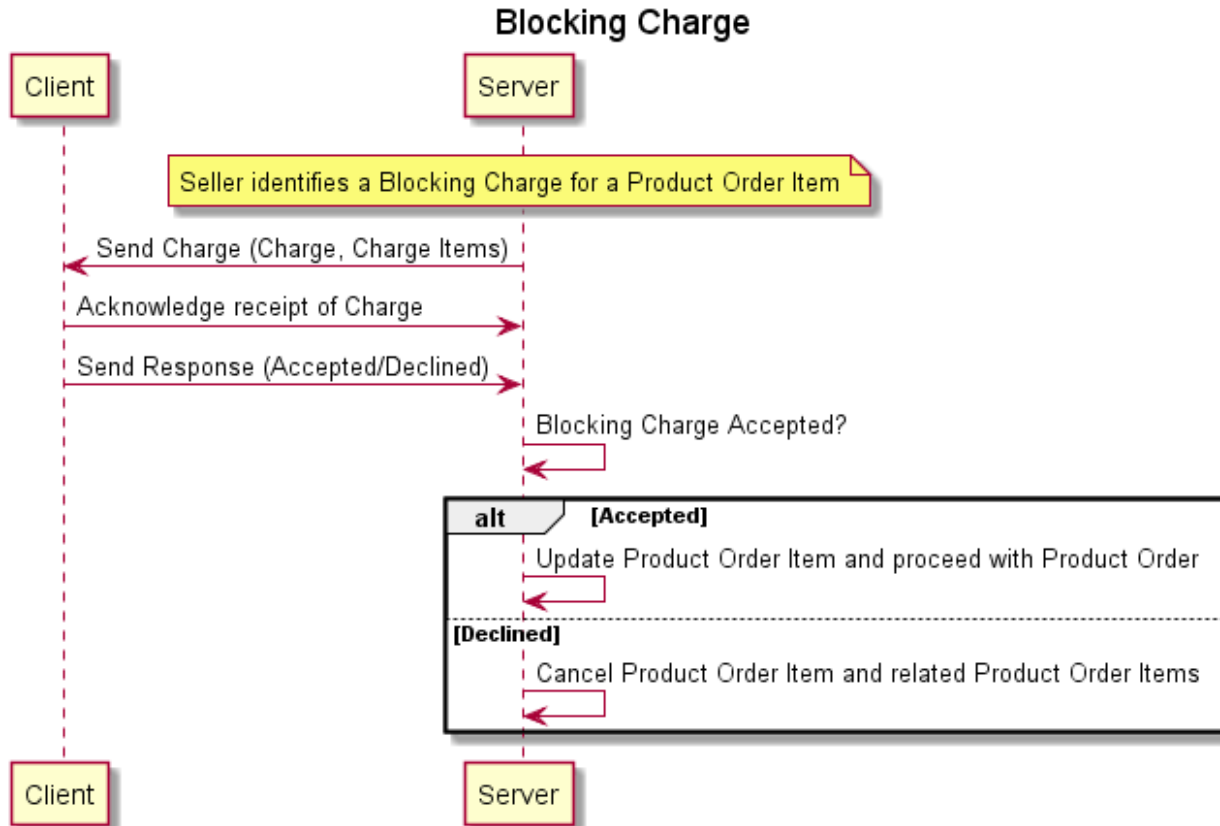


Figure 5 – Blocking Charge Sequence Diagram

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

- A Charge contains one or more recurring, non-recurring, or usage-based Charge Items related to the same Product Order Item or Product Order
- A Product Order Item or Product Order cannot have more than one Charge in status AWAITING_RESPONSE at the same time
- A Charge may be initiated for a Product Order in the following Product Order states: ASSESSING_CANCELLATION, ASSESSING_MODIFICATION.
- A Charge may be initiated for a Product Order Item in the following Product Order Item states: IN_PROGRESS 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 can be included for each Product Order Item within a Product Order. This list is empty if no new or updated costs are identified by the Seller during the Product Order process for the Product Order Item. In the case of a Buyer requesting to cancel a Product Order, the Charge is associated with the Product Order and a list of Charge Identifiers can be included for the Product Order. In the case of a Modify

Product Order Item Requested Delivery Date, the list of Charge Identifiers can be included for each Product Order Item included in the request.

7.3.2 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 Requested Delivery Date request by setting the Product Order Item Expedite Indicator attribute to TRUE.

The Seller determines if they will accept the expedite request contained in the Modify Product Order Item Requested Delivery Date request. The Seller determines what, if any, extra costs are to expedite the Product Order Item. Before the Seller is willing to accept the expedite, they include any Charge Items in a Charge and notify the Buyer that a Charge has been created. The Charge Items indicate 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 a PENDING state and the Product Order in the ASSESSING_MODIFICATION state while awaiting confirmation on acceptance of the Charge from the Buyer.

If the Buyer accepts the Charge Item(s) associated with expediting the Product Order Item, the Seller proceeds with the Product Order, expediting the appropriate Product Order Item. The Seller adds the costs associated with expediting the Product Order Item in the Product Order Item Related Charges attribute. If the Buyer declines the Charge Item(s) associated with expediting the Product Order item, the Seller proceeds with the Product Order without expediting the Product Order Item.

7.3.3 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 by notifying the Buyer that a Charge has been created, specifying that the Charge Item Price Category is Construction and the Charge Item Price. Normally, Construction Charges are considered Blocking Charges by the Seller.

[R2] If Charge Items are Blocking, they **MUST** be marked as Blocking.

The Buyer reviews the Seller's Charge 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 Item Acceptance Indicator to TRUE for all Charge Items included in the Charge.

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

If the Buyer accepts the Charge Item(s) associated with the construction charges, the Seller proceeds with the Product Order. The Seller adds the costs associated with expediting the Product Order Item in the Product Order Item Related Charges attribute. If the Buyer declines the Charge

Item(s) associated with the construction charges and the Seller indicated that these are blocking charges, the Seller fails the Product Order Item and any related Product Order Items. An example of construction charges are the costs associated with installing a UNI at a Customer location. If the Buyer declines these charges, the Seller cannot deliver the products which are using that UNI to connect to the Customer and therefore cancels the Product Order Item that specifies the UNI and cancels any Product Order Items that are related to that Product Order Item.

7.3.4 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 by notifying the Buyer that a Charge has been created containing at least one Charge Item having Charge Item Price Category as Connection and specifying a Charge Item Price.

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

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

If the Buyer accepts the Charge Item(s) associated with the connection charges, the seller proceeds with the Product Order. The Seller adds the costs associated with the connection to the Product Order Item in the Product Order Item Related Charges attribute. If the Buyer declines the Charge Item(s) associated with the connection charges and the Seller indicated that these are blocking charges, the Seller sets the Product Order Item to FAILED.

7.3.5 Cancel Product Order Charges

If the Buyer submits a Cancel Product Order request, the Seller reviews the request and determines if there are any charges associated with the Cancel Product Order. Examples of when there might be charges associated with a Cancel Product Order are when the Seller has made dispatches to the Customer location or other locations which incur costs for the Seller or when the Seller has paid for permits associated with the installation of a UNI (permission to dig up the street).

If the Seller determines that there are charges associated with the Cancel Product Order, they initiate a Charge and communicates the charges to the Buyer. Note that these are always Blocking charges.

The Buyer reviews the Charge and associated Charge Items and determines if they will accept the charges or decline them. If accepted, the Seller moves forward with the Cancel Product Order. If declined, the Seller sets the Cancel Product Order to DECLINED and continues to process the Product Order.

8 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
Comments	Comments about the attribute

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.

8.1 Buyer and Seller Attributes

Table 31 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 9.17 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 9.17 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 31 – Buyer and Seller Attributes

[R3] The Seller Response Code **MUST** be included in all Seller responses.

8.2 Product Order Attributes

The attributes associated with the Create New Product Order request (Use Case 1-a), Create Change Product Order request (Use Case 1-b), Create Disconnect Product Order request (Use Case 1-c), and Cancel Product Order request (Use Case 8) for a Product Order are shown in Table 32.

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
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 and a Product Order Identifier was assigned	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 Type	Identifies the type of reason, Technical or Commercial, for the Cancellation	One of : <ul style="list-style-type: none"> • TECHNICAL • COMMERCIAL 	
Cancellation Reason	A 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 Product Order request.

Attribute	Description	Type	Comments
Cancel Product Order Charge	Charges associated with cancelling the Product Order	List of references to Charges	Set by the Seller.
Note	Free form text to clarify or explain the Product Order	List of Note (Table 47)	
Product Order Item	Items contained in the Product Order.	List of Product Order Item (Table 34)	A Product Order contains at least one Product Order Item.
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 • COMPLETED • 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.
Contact	Identifies the name of the person or office that is one of a list of contacts shown in [R6].	List of Contact (Table 38)	

Attribute	Description	Type	Comments
Seller Contact	Identifies the name of the person or office that is selling the product.	Contact (Table 38)	Set by Seller

Table 32 – Product Order Attributes

8.2.1 Updatable Product Order Attributes

The Product Order Attributes that can be updated as described in the Update Product Order by Product Order Identifier Use Case are defined in Table 33.

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 47)	Only new notes can be entered. The Buyer and Seller cannot modify an existing Note.
Product Order Contact	Identifies the name of the person or office that is responsible for the Product Order within the Buyer's organization.	Contact (Table 38)	

Table 33 – Updatable Product Order Attributes

Note: Attributes that are not included in Table 33 are not updatable by the Buyer. If the Buyer desires to update attributes that are not updatable, they must cancel the Product Order and resubmit with the correct attribute values.

8.3 Product Order Item Attributes

Product Order Item attributes are shown in Table 34.

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.
Product Order Item Product Action	Action to be applied 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 46)	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 depending on the end customer.	string	Set by the Buyer
Product Order Item Relationship	The relationship between Product Order Items in the Product Order	List of Product Order Item Relationships (Table 40)	
Product Order Item	The interval after the completion of one or	List of Product Order Item	

Attribute	Description	Type	Comments
Coordinated Action	more related Product Order Items that this Product Order Item can be started or completed.	Coordinated Action (Table 41)	
Product Relationship	The relationship between a Product Order Item and one or more existing Products.	List of Product Relationship (Table 43)	
Product Order Item Note	A set of informative notes associated to the Product Order Item. This can be empty. This is not to be used to inform the Seller of Actions that the Buyer wishes performed.	List of Note (Table 47)	Only new notes can be entered. The Buyer and Seller cannot modify an existing Product Order Item Note.
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 7.3.2 for a description of the interaction between the Buyer and the Seller.
Product Order Item Expedite Accepted Indicator	Indicates if the Seller has accepted the Buyer's Expedite request.	Boolean	See section 7.3.2 for a description of the interaction between the Buyer and Seller. Set by the Seller. Default Value = FALSE. If this is set to TRUE, the Seller provides the costs to

Attribute	Description	Type	Comments
			expedite the Product Order in the Related Charges attribute.
Related Charges	The Charges associated to this Product Order Item	List of references to Charges	This list contains all completed Charges containing accepted Charge Items initiated by the Seller. See section 7.3 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
Contact	Identifies the name of the person or office that is one of a list of contacts shown in [R6].	List of Contacts (Table 38)	
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
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 52)	Set by the Buyer. The POQ attributes may be required by the Seller. In that case, this is a

Attribute	Description	Type	Comments
			mandatory attribute. 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 • CANCELLED • COMPLETED • FAILED • HELD • IN_PROGRESS • PENDING • REJECTED • UNASSESSED • VALIDATED 	Set by the Seller.
Product Order Item Milestone	Milestones associated to the Product Order Item.	List of Milestones (current and history). Specific to the Product Specification	Set by the Seller when a Milestone occurs.
Product Order Item Quote Item	The Quote and Quote Item associated to this Product Order Item.	Quote Item Reference Attributes (Table 53)	Set by the Buyer. The Quote attributes may be required by the Seller. In that case, this is a mandatory attribute. If the Seller does not require the Quote, then this is an optional attribute.
Requested Product Order Item Term	Requested term of the Product Order Item	Term (Table 51)	Set by the Buyer
Product Order Item Term	Term of the Product Order Item	Term (Table 51)	Set by the Seller

Attribute	Description	Type	Comments
Related Buyer Purchase Order Number	Identifies the Buyer Purchase Order that is related to this Product Order Item.	String	Set by the Buyer and retained by the Seller.
Buyer Billing Information	Billing account information for the billing account the Buyer wants used for the Product Order Item	Buyer Billing (Table 39)	
Agreement Name	The name of the Agreement which is referenced for the Product Order Item.	String	Required in Product Order if not included in Quote.

Table 34 – 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.

8.3.1 Updatable Product Order Item Attributes

Product Order Item attributes that can be updated by the Buyer are shown in Table 35.

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 47)	Only new notes can be entered. The Buyer cannot modify an existing Product Order Item Note.
Contact	Identifies the contact information of a Contact	Contact (Table 38)	

Attribute	Description	Type	Comments
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 35 – Updatable Product Order Item Attributes

[R4] The Buyer **MUST** only be able to modify the following contacts:

- Buyer Order Contact
- Buyer Implementation Contact
- Buyer Technical Contact
- Buyer Fault Contact
- Buyer GDPR Contact
- Buyer Other Contact

Note: Attributes that are not included in Table 35 are not updatable by the Buyer. If the Buyer desires to update attributes that are not updatable, they must cancel the Product Order and resubmit with the correct attribute values.

8.4 Modify Product Order Item Requested Delivery Date Attributes

The Modify Product Item Requested Delivery Date attributes are detailed in Table 36.

Attribute	Description	Type	Comments
Modify Product Order Item Requested Delivery Date Identifier	Unique identifier for the Modify Order Item Requested Delivery Date that is generated by the Seller when the Modify Product Order Item Requested Delivery Date request is moved to the ACKNOWLEDGED state.	Identifier	Set by the Seller
Modify Product Order Item Requested Delivery Date Create Date	The date on which the Seller assigned the Modify Product Order Item Requested	Datetime	Set by the Seller

Attribute	Description	Type	Comments
	Delivery Data Identifier.		
Product Order Identifier	Identifier of the Product Order of which the Buyer wants to modify the Product Order Item Requested Delivery Date.	Identifier	Provided by Buyer in the request
Product Order Item Reference Identifier	Identifier of the Product Order Item(s) within the indicated Product Order for which the modification is requested.	List of 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 Requested Delivery Date State	The state of the Modify Product Order Item Requested Delivery Date	One of: <ul style="list-style-type: none"> • ACKNOWLEDGED • ASSESSING_CHARGE • COMPLETED • DECLINED • REJECTED 	Set by the Seller

Table 36 – Modify Product Order Item Date Attributes

8.5 Cancel Product Order Attributes

The Cancel Product Order attributes are detailed in Table 37.

Attribute	Description	Type	Comments
Cancel Product Order Identifier	Unique identifier for the Cancel Product Order that is generated by the Seller when the Cancel Product Order request state is set to ACKNOWLEDGED	Identifier	Provided by the Seller
Product Order Identifier	Identifier of the Product Order the Buyer wants to cancel with this Cancel Product Order request.	Identifier	
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 Cancel Product Order.	One of the following <ul style="list-style-type: none"> • ACKNOWLEDGED • ASSESSING_CHARGE • ACCEPTED • DECLINED • REJECTED 	Set by the Seller
Contact	Identifies the contact information of a Contact	List of Contacts (Table 38)	Set by Buyer or Seller
Cancellation Reason Type	Identifies the type of reason, TECHNICAL or COMMERCIAL , for the Cancellation request	One of: <ul style="list-style-type: none"> • TECHNICAL • COMMERCIAL 	Set by the Buyer
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.
Cancellation Denied Reason	If the Cancel Product Order request is denied by the Seller, the Seller provides a reason to the Buyer using this attribute.	String	Set by the Seller
Related Charge	The Charge Identifier of any charges that are related to the Cancel Product Order.	String	Set by the Seller

Table 37 – Cancel Product Order Attributes

8.6 Contact Attributes

Table 38 contains the Contact attributes.

Attribute	Description	Type	Comments
Contact Name	Identifies the name of the person or office that is the Contact.	String	
Contact Role	Role of the Contact	One of: <ul style="list-style-type: none"> • Buyer Order Contact • Buyer Implementation Contact • Buyer Technical Contact • Buyer Fault Contact • Buyer Cancel Product Order Contact • Buyer Billing Contact • Seller Order Contact • Seller Implementation Contact • Seller Technical Contact • Seller Fault Contact • Seller Cancel Product Order Contact 	Set by Buyer or Seller
Contact Phone Number	Identifies the telephone number (excluding extension) of the Contact.	String	
Contact Phone Number Extension	Identifies the telephone number extension of the Contact	String	
Contact Email Address	Identifies the Email address of the Contact	String	
Contact Postal Address	Identifies the postal address of the person or office to be contacted.	Fielded Address (see MEF 79 [7] section 8.9.2)	Provided by value

Attribute	Description	Type	Comments
Contact Organization	The organization or company that the contact belongs to	String	

Table 38 – Contact Attributes

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

[R5] A Contact **MUST** include the following attributes defined in Table 38:

- Contact Name
- Contact Phone Number
- Contact Email Address

[O2] A Contact **MAY** contain the following attributes as specified in Table 38:

- Contact Phone Number Extension
- Contact Postal Address
- Contact Organization

[R6] The following Contacts **MUST** be supported by both Buyer and Seller:

- Order Contact
- Implementation Contact
- Technical Contact
- Fault Contact

[O3] The Buyer and Seller **MAY** agree on other contact roles.

8.7 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. Note that this is called the Invoice Identifier in MEF W134 [10].

Table 39 – Buyer Billing Attributes

8.8 Product Order Item Relationship Attributes

Table 40 shows Product Order Item Relationship attributes.

Attribute	Description	Type	Comments
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

Table 40 – 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.

8.9 Product Order Item Coordinated Action

Table 41 shows Coordinated Action attributes.

Attribute	Description	Type	Comments
Coordinated Product Order Item Reference Identifier	Specifies one Product Order Item that is to be coordinated with	Product Order Item Reference Identifier	Set by the Buyer

	this Product Order Item.		
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 41 – Product Order Item Coordination Action Attributes

Two terms, Specified and Coordinated, are used to describe the Coordination Dependency. For purposes of this table, these are defined as:

- Specified – the Product Order Item with a Product Order Item Coordinated Action
- Coordinated – one or more Product Order Items that are described as having a dependency on the Specified Product Order Item

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

Dependency Type	Product Order Item A	Coordinated Product Order Items B/C
START_TO_START – Work on the Specified Product Order Item can only be started after the Coordinated Product Order Items are started.	Starts after Product Order Items B and C	Start before Product Order Item A
START_TO_FINISH – The Coordinated Product Order Items must complete before work on the Specified Product Order Item begins.	Starts after Product Order Items B and C complete	Complete before Product Order Item A starts
FINISH_TO_START – Work on the Related Product Order Items begins after the completion of the Specified Product Order Item.	Completes before Product Order Items B and C start	Start after Product Order Item A completes
FINISH_TO_FINISH – Work on the Related Product Order Items completes at the same time as the Specified Product Order Item.	Completes at the same time as Product Order Items B and C	Complete at the same time as Product Order Item A

Table 42 – Product Order Item Coordination Dependency

In Table 42 Product Order Item A has a dependency of some type on Product Order Items B and C.

8.10 Product Relationship Attributes

Table 43 shows Product Relationship attributes.

Attribute	Description	Type	Comments
Related Product Identifier	A list of one or more Identifier of the related Products in the Product Inventory.	Product Identifier	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 43 – Product Relationship Attributes

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.

Note: The two attributes shown in Table 43 are repeated for each Product Identifier that has a relationship with the Product Order Item.

8.11 Notification Registration Attributes

Table 44 shows the Notification Registration attributes.

e	Description	Type	Co
on	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.	String	Fo St
on	The types of notifications that the Buyer wishes to receive.	List of one or more of: <ul style="list-style-type: none"> • CANCEL_PRODUCT_ORDER_STATE_CHANGE • CHARGE_CREATE • CHARGE_STATE_CHANGE • CHARGE_TIMEOUT • MODIFY_PRODUCT_ORDER_ITEM_REQUESTED_DELIVERY_DATE_STATE_CHANGE • PRODUCT_ORDER_ITEM_EXPECTED_COMPLETION_DATE_SET • PRODUCT_ORDER_STATE_CHANGE • PRODUCT_ORDER_ITEM_STATE_CHANGE • PRODUCT_SPECIFIC_PRODUCT_ORDER_ITEM_MILESTONE 	
	Specification to Start Notifications or Stop Notifications.	One of: <ul style="list-style-type: none"> • START • STOP 	

Table 44 – Register for Notifications Buyer Attributes

[R7] The Buyer **MUST** register for CHARGE_CREATE notifications if the Seller supports Charges across the API.

[O4] The Buyer **MAY** register for other Charge related notifications if they are supported by the Seller.

8.12 Notification Attributes

Table 45 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	This is set 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_PRODUCT_ORDER • CHARGE • MODIFY_PRODUCT_ORDER_ITEM_REQUESTED_DELIVERY_DATE__ 	Set by the Seller
Notification Types	The type of notifications	One of <ul style="list-style-type: none"> • CANCEL_PRODUCT_ORDER_STATE_CHANGE • CHARGE_CREATE • CHARGE_STATE_CHANGE • CHARGE_TIMEOUT • MODIFY_PRODUCT_ORDER_ITEM_REQUESTED_DELIVERY_DATE_STATE_CHANGE • PRODUCT_ORDER_ITEM_EXPECTED_COMPLETION_DATE_SET • PRODUCT_ORDER_STATE_CHANGE • PRODUCT_ORDER_ITEM_STATE_CHANGE • PRODUCT_SPECIFIC_PRODUCT_ORDER_ITEM_MILESTONE 	

Table 45 – Seller Notification Attributes

[R8] The Seller **MUST** support the CHARGE_CREATE notification if the Seller supports Charges on the API.

- [O5] The Seller **MAY** support the CHARGE_STATE_CHANGE and CHARGE_TIMEOUT notifications if the Seller supports Charges on the API.

8.13 Place Relationship Attributes

Table 46 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 formatting 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 • FIELDDED_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 Product Order Item Location Type. MEF 79.0.2 [8] 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 [7] section 8.10) • Fielded Address (see MEF 79 [7] section 8.9.2) • Formatted Address (see MEF 79 [7] section 8.9.3) • Global Address Label (see MEF 79 [7] section 8.9.4 and MEF 79.0.2 [8]) • Geographic Point (see MEF 79 [7] section 8.9.6 and MEF 79.0.2 [8]) 	

Table 46 – 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.

8.14 Note Attributes

Table 47 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 Create Product Order or when Updating a Product Order. The Seller may add notes at any time.
Note Author	The author of the note.	String	
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 47 – Note Attributes

- [R9] A Seller **MUST** have the ability to add a Note with a Note Source of SELLER.
- [R10] A Seller **MUST NOT** have the ability to add a Note with a Note Source of BUYER.
- [R11] A Buyer **MUST** have the ability to add a Note with a Note Source of BUYER.
- [R12] A Buyer **MUST NOT** have the ability to add a Note with a Note Source of SELLER.
- [R13] Notes **MUST NOT** be able to be modified or deleted once entered

8.15 Charge Attributes

Table 48 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	Identifier of the Product Order of which the Seller is communicating additional or modified costs to the Buyer.	Identifier	Provided by the Seller
Cancel Product Order Identifier	Identifier of the Cancel Product Order of which the Seller is communicating costs to the Buyer.	Identifier	Provided by the Seller
Modify Product Order Item Requested Delivery Date Identifier	Identifier of the Modify Product Order Item Requested Delivery Date Identifier of which the Seller is communicating costs to the Buyer.	Identifier	Provided by Seller
Product Order Item Reference Identifier	The Product Order Item Reference Identifier for the Product Order Item that the Charge is related to.	String	Provided by the Seller and matches the Product Order Item Reference Identifier in the Product Order request
Charge Items	A list of Charge Items contained in the Charge	List of Charge Items (Table 49)	Set by the Seller
Response Due Date	The date by which the Buyer must respond to the Seller's Charge	dateTime	Set by the Seller If there is no response received by the Response Due Date the Seller will set all Charge Items in status DECLINED_BY_BUYER and put the Charge in status TIMEOUT.

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

Table 48 – Charge Attributes

8.16 Charge Item Attributes

Table 49 shows the Charge Item attributes.

Attribute	Description	Type	Comments
Charge Item Identifier	An identifier that is unique among all Charge Items within a Charge	Identifier	Set by the Seller
Charge Item Price 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 Item Price Category	A name of the Charge Item Price Category	One of: <ul style="list-style-type: none"> • EXPEDITE • CONSTRUCTION • CONNECTION • CANCELLATION • DISCONNECT • OTHER 	Set by Seller
Charge Item Activity Type	Indicates if this is a new charge or a change to a charge provided in a Quote or in a previous accepted Charge Item.	One of: <ul style="list-style-type: none"> • NEW • CHANGE 	Set by the Seller
Charge Item Price Recurring Charge Period	Used for a Charge with a Charge Item Price Type = RECURRING to indicate the period	One of <ul style="list-style-type: none"> • HOUR • DAY • WEEK • MONTH • YEAR 	Set by the Seller

Attribute	Description	Type	Comments
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 Indicator	Indicates if rejecting the charge will cause the Seller to cancel the Product Order Item or close the Cancel Product Order or Modify Product Order Item Requested Delivery Date without action.	Boolean	Set by the Seller
Charge Item Price	The value associated with the Charge Item	Price (Table 50)	Set by the Seller
Note	A note that references the Charge Item	List of Notes (Table 47)	Set by Seller or Buyer
Charge Item 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 49 – Charge Item Attributes

8.17 Price Attributes

Table 50 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

Attribute	Description	Type	Comments
Price Duty Free Amount	All taxes excluded amount (expressed in the given currency).	Money <ul style="list-style-type: none"> • Currency • Value 	Mandatory attribute set by the Seller.

Table 50 – Price Attributes

8.18 Term Attributes

Table 51 shows the Term attributes.

Attribute	Description	Type	Comments
Product Order Item Term Name	Name of the term	String	Set by the Buyer in Requested Product Order Item Term. This is set by the Seller in Product Order Item Term
Product Order Item Term Description	Description of the term	String	Set by the Buyer in Requested Product Order Item Term. This is set by the Seller in Product Order Item Term
Product Order Item Term Duration	Duration of the term	Duration	Set by the Buyer in Requested Product Order Item Term. This is set by the Seller in Product Order Item Term.

Attribute	Description	Type	Comments
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 in Requested Product Order Item Term. This is set by the Seller in Product Order Item Term. 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 for the Product after the original term has expired.	Duration	Set by the Buyer in Requested Product Order Item Term. This is set by the Seller in Product Order Item Term.

Table 51 – Term Attributes

8.19 POQ Item Reference Attributes

Table 52 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 [7]. 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 [7].

Attribute	Description	Type	Comments
			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 Product Order Item, they identify the alternate proposal using the Alternate Product Proposal Identifier from the POQ response as specified in MEF 79 [7].

Table 52 – POQ Item Reference Attributes

8.20 Quote Item Reference Attributes

Table 53 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 [9]. The Seller can make this field mandatory or optional. If mandatory, the Buyer must include the Quote Identifier and the Quote Item Identifier.
Quote Item Identifier	Identifier of the Quote Item	String	A unique identifier of the Quote item. Provided by the Buyer from the Seller's response to a Create Quote request as specified in MEF 80 [9]. Seller can make this field mandatory or optional.

Table 53 – Quote Item Reference Attributes

8.21 Duration

Table 54 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 54 – Duration Attributes

9 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.

9.1 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.

9.1.1 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.

[R14] The Buyer’s Create Product Order request **MUST** contain the following attributes as specified in Table 32:

- Product Order Contact
- At least one Product Order Item (see section 9.1.4 for detail on Product Order Item requirements)

[O6] The Buyer’s Create Product Order request **MAY** contain any attributes identified in Table 32 as settable by the Buyer and not included in [R14].

[R15] The Buyer's Create Product Order request **MUST NOT** contain any attributes identified in Table 34 as settable by the Seller.

[O7] The Seller **MAY** require that the Buyer perform a POQ prior to submitting the Product Order.

[CR5]<[O7] The Buyer's Create Product Order request **MUST** contain the POQ Identifier if required by the Seller.

[O8] The Seller **MAY** require that the Buyer perform a Quote prior to submitting the Product Order.

[CR6]<[O8] The Buyer's Create Product Order request **MUST** contain the Quote Identifier if required by the Seller.

9.1.2 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.

[R16] When providing a response if the Seller Response Code indicates success, the Seller **MUST** specify the following attributes defined in Table 32 in the response:

- Product Order Identifier
- Product Order State
- Seller Contact

[R17] The Product Order Identifier **MUST** remain the same value for the life of the Product Order.

[R18] When providing a Response if the Seller Response Code does not indicate success, the Seller **MUST NOT** specify the Product Order Identifier attribute in the response.

[R19] The Seller's response **MUST** include Product Order attributes defined in Table 32 copied from the Buyer's Create Product Order request as specified in [R14] and [O6].

9.1.3 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.

[R20] If the Product Order State changes to FAILED, the Product Order Final State Date **MUST** contain the date the Product Order moved to the FAILED state.

- [R21] If the Product Order State in the Seller's response is COMPLETED, the response **MUST** contain the Product Order Final State Date attribute as defined in Table 32.
- [O9] The Seller **MAY** add a Note to any Product Order that is not in the COMPLETED, PARTIAL, REJECTED, CANCELLED, or FAILED states.

9.1.4 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.

- [R22] Each Product Order Item in the Buyer's Create Product Order request **MUST** contain the following attributes as specified in Table 34:
- Buyer Product Order Item Contact
 - Buyer Implementation Contact
 - Buyer Technical Contact
- [R23] The Buyer's Create Product Order request **MUST** contain the following attributes as specified in Table 34:
- Product Order Item Reference Identifier
 - Product Order Item Product Action
 - Product Order Item Requested Completion Date
- [O10] The Seller **MAY** require that the Buyer Billing Attributes be the same for all Product Order Items in a Product Order.
- [O11] The Buyer's Create Product Order request **MAY** contain the following as specified in Table 34:
- 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

- [R24] 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 34.
- [R25] 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 34.
- [R26] If the Product Order Item Location Type as defined in Table 46 is SERVICE_SITE_IDENTIFIER, the Buyer's Create Product Order request **MUST** contain a Service Site Identifier as defined in Table 46.
- [R27] If the Product Order Item Location Type as defined in Table 46 is FIELDED_ADDRESS, the Buyer's Create Product Order request **MUST** contain the Fielded Address attributes defined in Table 46.
- [R28] If the Product Order Item Location Type as defined in Table 46 is FORMATTED_ADDRESS, the Buyer's Create Product Order request **MUST** contain the Formatted Address attributes defined in Table 46.
- [R29] If the Product Order Item Location Type as defined in Table 46 is GLOBAL_ADDRESS, the Buyer's Create Product Order Request **MUST** contain the Global Address attributes defined in Table 46.
- [R30] If the Product Order Item Location Type as defined in Table 46 is GEOGRAPHIC_POINTS, the Buyer's Create Product Order request **MUST** contain the Geographic Points attributes defined in Table 46.
- [R31] If the Product Order Item Quote Item is provided, then the Buyer **MUST** provide the Quote Identifier and the Quote Item Identifier.

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

- [R32] The Seller's response to the Buyer's Create Product Order request **MUST** contain the Product Order Item State as defined in Table 34.
- [R33] The Seller's response **MUST** include all Product Order Item attributes as defined in Table 34 copied from the Buyer's Create Product Order request.
- [R34] 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.
- [R35] 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.

- [R36] If the Product Order Item State in the Seller's response is CANCELLED or FAILED, the Product Order Item Expected Completion Date attribute **MUST NOT** be provided.
- [R37] If the Product Order Item State in the Seller's response is IN_PROGRESS, the Product Order Item Expected Completion Date attribute **MUST** be provided
- [R38] 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.

9.1.6 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.

- [R39] If there are any additional non-recurring costs associated with the Product Order Item and the Product Order State is ASSESSING_CHARGE, the Seller's response **MUST** have the Related Charges attribute filled with these non-recurring costs.
- [R40] 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.
- [R41] 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.
- [R42] 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.

9.1.7 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.

- [R43] The Buyer **MUST** provide the Requested Product Order Item Term including the Product Order Item Term Name, Product Order Item Term Duration, and End of Term Action.
- [R44] If the End of Term Action is Roll, the Buyer **MUST** provide the Roll Interval.
- [R45] 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 34.
- [R46] The Buyer's Create Product Order request **MUST** contain a Product Order Item Product Offering Identifier.

- [R47] The Buyer **MUST** include the Buyer Billing Account as specified in Table 34 and Table 39 even if the presumed price is zero.
- [R48] 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 34 and Table 41.

9.1.8 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. These requirements are covered as Common requirements in section 9.1.6.

9.1.9 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.

- [R49] If the Seller does not support the Requested Product Order Item Term, the Seller **MUST** reject the Product Order Item and move the Product Order Item to the REJECTED state.
- [R50] If the Requested Product Order Item Term does not match the term from a referenced Quote, the Seller **MUST** reject the Product Order Item and move the Product Order Item to the REJECTED state.
- [R51] 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.
- [R52] 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.
- [R53] 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.

9.1.10 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.

- [R54] The Buyer **MUST** provide the Requested Product Order Item Term if required by the Seller for the requested change.

- [R55] 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 34.
- [R56] The Buyer's Create Product Order request **MUST** contain a Product Order Item Product Identifier for an existing product.
- [O12] If the Product Order Item Product Action is CHANGE, the Buyer's Create Product Order request **MAY** contain the Buyer Billing Information as specified in Table 34.

9.1.11 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.

- [R57] 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.

9.1.12 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.

- [R58] The Buyer's Create Product Order request **MUST** contain a Product Order Item Product Identifier for the existing product to be disconnected.
- [R59] The Buyer **MUST NOT** provide any attributes not specified in [R58].

9.1.13 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.

- [R60] 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.

9.2 Update Product Order Attributes

The Buyer has an ability to update a limited set of Product Order Attributes by Product Order Identifier. The Update Product Order requirements are defined in this section.

9.2.1 Buyer Update Product Order Attributes Request

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

- [R61] A Buyer's Update Product Order Attributes by Product Order Identifier request **MUST** contain the following attributes:
- Product Order Identifier
- [R62] A Buyer's Update Product Order Attributes by Product Order Identifier **MUST** contain one or more of the attributes shown in Table 33.
- [R63] A Buyer's Update Product Order Attributes by Product Order Identifier request **MUST NOT** contain attributes not included in [R61] and [R62].
- [R64] When the Buyer is adding a Note, the list of Notes **MUST** be appended with the new Note.

9.2.2 Seller Update Product Order Attributes by Product Order Identifier Response

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

- [R65] The Seller **MUST** indicate if the Update Product Order Attributes by Product Order Identifier request was successful or not using the Seller Response Code.
- [R66] If successful, the Seller **MUST** update the Product Order Attribute(s) as requested by the Buyer.
- [R67] If not successful, the Seller **MUST NOT** update the Product Order.

9.2.3 Buyer Update Product Order Item Attributes Request

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

- [R68] A Buyer's Update Product Order Item Attributes request **MUST** contain the following attributes:
- Product Order Identifier
 - Product Order Item Reference Identifier
- [R69] A Buyer's Update Product Order Item Attributes request **MUST** contain one or more of the updateable attributes shown in Table 35.
- [R70] A Buyer's Update Product Order Attributes request **MUST NOT** contain attributes not included in [R68] and [R69].

9.2.4 Seller Update Product Order Item Attributes Response

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

[R71] The Seller **MUST** indicate if the Update Product Order Item Attributes request was successful or not using the Seller Response Code.

[R72] If successful, the Seller **MUST** update the Product Order Item Attribute(s) as requested by the Buyer.

[R73] If not successful, the Seller **MUST NOT** update the Product Order Items.

9.3 Modify Product Order Item Requested Delivery Date

There are two sub-Use Cases supported by the Modify Product Order Item Requested Delivery Date request. The supported sub-Use Cases are:

- Changing the Expedite Indicator
- Changing the Requested Completion Date of the Product Order Item

Each of these are shown in this section.

9.3.1 Modify Expedite Indicator

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

9.3.1.1 Buyer Modify Expedite Indicator Request

This section defines the Modify Product Order Item Requested Delivery Date attributes and requirements for the Buyer's Modify Expedite Indicator request to expedite a Product Order Item.

[R74] The Buyer's Modify Product Order Item Requested Delivery Date request **MUST** contain the following attributes as specified in Table 36:

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

[O13] The Buyer's Modify Product Order Item Requested Delivery Date request **MAY** contain the Product Order Item Requested Completion Date as specified in Table 36.

9.3.1.2 Seller Modify Expedite Indicator Response

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

[R75] If the Seller Response Code indicates success, the Seller **MUST** specify the following attributes defined in Table 36 in the response:

- Modify Product Order Item Requested Delivery Date Identifier

- Modify Product Order Item Requested Delivery Date State
- Modify Product Order Item Requested Delivery Date Create Date

[R76] The Seller response **MUST** echo back all attributes and values received in the Buyer's request.

[R77] The Modify Product Order Item Requested Delivery Date Identifier **MUST** remain the same value for the life of the Modify Product Order Item Requested Delivery Date request.

9.3.2 Modify Product Order Item Requested Delivery Date

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

9.3.2.1 Buyer Create Modify Product Order Item Requested Delivery Date Request

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

[R78] The Buyer's Create Modify Product Order Item Requested Delivery Date request to modify the Requested Completion Date **MUST** contain the following attributes as specified in Table 36:

- Product Order Identifier
- Product Order Item Reference Identifier
- Product Order Item Requested Completion Date

9.3.2.2 Seller Create Modify Product Order Item Requested Delivery Date Response

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

[R79] If the Seller Response Code indicates success, the Seller **MUST** specify the following attributes defined in Table 36 in the response:

- Modify Product Order Item Requested Delivery Date Identifier
- Modify Product Order Item Requested Delivery Date State
- Modify Product Order Item Requested Delivery Date Create date

[R80] The Seller response **MUST** echo back all attributes and values from the Buyer's request.

- [R81] The Modify Product Order Item Requested Delivery Date Identifier **MUST** remain the same value for the life of the Modify Product Order Item Requested Delivery Date.

9.4 Initiate Charge

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

9.4.1 Initiate Charge

This section defines the attributes and requirements of the Initiate Charge Use Case. 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 that was not included or was incorrect in the Quote, associated to a Cancel Product Order request, or associated to a Modify Product Order Item Requested Delivery Date request. The Seller creates the Charge internal to their systems and sends a CHARGE_CREATE notification to the Buyer. See section 9.16 for details on the CHARGE_CREATE notification.

9.4.2 Charge Contents

When a Seller creates a Charge within their systems and sends a CHARGE_CREATE notification, the Charge and associated Charge Items are to comply with the following requirements.

- [R82] When the Seller initiates the Charge on a Product Order Item, the following, as defined in Table 48 **MUST** be included:

- Charge Identifier
- Charge Create Date
- Product Order Identifier
- Charge Item(s)
- Response Due Date
- Charge State

- [R83] When the Seller initiates a Charge associated to a Product Order Item or a Modify Product Order Item Requested Delivery Date, the following attribute as defined in Table 48 **MUST** be included:

- Product Order Item Reference Identifier

- [R84] When the Seller initiates a Charge associated to a Cancel Product Order, the following as defined in Table 48 **MUST** be included:

- Charge Identifier

- Charge Create Date
- Product Order Identifier
- Charge Item(s)
- Response Due Date
- Charge State

[R85] For each Charge Item included in the Charge, the Seller **MUST** include the following attributes as defined in Table 49:

- Charge Item Identifier
- Charge Item Price Type
- Charge Item Price Category
- Charge Item Activity Type
- Blocking Indicator
- Charge Item Price
- Charge Item State

[R86] Table 55 shows the attributes that **MUST** be included in the Charge Item based on the Charge Item Price Type.

Charge Item Price Type	Recurring Charge Period	Charge Item Unit of Measure	Charge Item Price
RECURRING	X		X
NON-RECURRING			X
USAGE_BASED		X	X

Table 55 – Price Type Required Information

[R87] A Product Order Item **MUST NOT** have more than one Charge active at the same time.

[R88] A Product Order **MUST NOT** have more than one Charge active at the same time.

- [R89] A Product Order and a Product Order Item within the Product Order **MUST NOT** have Charges active at both the Product Order and Product Order Item at the same time.

9.4.3 Retrieving Charge

When the Buyer becomes aware that a Charge exists for a given Product Order, Cancel Product Order, or Modify Product Order Item Requested Delivery Date, they are able to retrieve the details of the Charge and Charge Items from the Seller. The Retrieve List of Charges and Retrieve Charge by Charge Identifier are defined in sections 9.13 and 9.14 respectively.

9.5 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 Item Acceptance Indicator for each Charge Item contained within the Charge. If a response is not received from the Buyer by the Response Due Date the Seller acts on the Charge Items and Charge.

- [R90] The Buyer's response to the Charge **MUST** update the following as defined in Table 49 for each Charge Item included in the Charge:

- Charge Item Acceptance Indicator

- [O14] The Buyer response to the Charge **MAY** update the Notes.

- [R91] The Buyer **MUST** update all Charge Items included in a Charge at one time.

9.5.1 No Response Received by Seller

If a Buyer fails to respond by the Response Due Date, the Seller complies with [R92].

- [R92] If there is no response received by the Response Due Date the Seller **MUST** set all Charge Items in status DECLINED_BY_BUYER and put the Charge in status TIMEOUT.

9.6 Cancel Product Order Request

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

- [R93] A Buyer **MUST** have submitted the Product Order request to be able to submit a Cancel Product Order request on the Product Order.

9.6.1 Buyer Cancel Product Order Request

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

[R94] The Buyer's Cancel Product Order request **MUST** contain the following attributes as specified in Table 37:

- Product Order Identifier
- Cancel Product Order Contact

[O15] The Buyer's Product Order Cancel request **MAY** contain the following attributes as specified in Table 37:

- Cancellation Reason Type
- Cancellation Reason

9.6.2 Seller Cancel Product Order Response

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

[R95] If the Seller Response Code indicates success, the Seller **MUST** echo back all Buyer specified attributes in the Buyer's Cancel Product Order request.

[R96] If the Seller Response Code indicates success, the Seller **MUST** specify the following attributes defined in Table 37 in the response:

- Cancel Product Order Identifier
- Cancel Product Order State
- Cancel Product Order Seller Contact

[R97] The Cancel Product Order Identifier **MUST** remain the same value for the life of the Cancel Product Order.

[R98] When providing a Response if the Seller Response Code does not indicate success, the Seller **MUST NOT** specify the Cancel Product Order Identifier attribute in the response.

9.7 Retrieve Product Order List

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

9.7.1 Buyer Retrieve Product Order List Request

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

[O16] The Buyer's Retrieve Product Order List request **MAY** contain none or more of the following attributes as defined in Table 32:

- Product Order Create Date (range of dates)
- Product Order Cancellation Date (range of dates)
- Product Order Final State Date (range of dates)
- Project Identifier
- Product Order State
- Buyer Product Order Identifier

[O17] The Buyer's Retrieve Product Order List request **MAY** contain any of the following attributes as defined in Table 34:

- Product Order Item Requested Completion Date (range of dates)
- Product Order Item Expected Completion Date (range of dates)

9.7.2 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.

[R99] If successful, the Seller's response to the Buyer's Retrieve Product Order List request **MUST** contain the following if set from Table 32 for each Product Order Identifier that matches the filter criteria:

- Product Order Identifier
- Buyer Product Order Identifier
- Product Order Cancellation Date
- Product Order State
- Project Identifier
- Product Order Create Date
- Product Order Final State Date

[R100] If the Seller Response Code does not indicate success, the Seller **MUST** only reply with the Response Code and no attributes.

[R101] If the Seller Response Code indicates success but no matching Product Orders are found, the Seller **MUST** return an empty list.

9.8 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 4). 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.

9.8.1 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.

[R102] The Buyer **MUST** include the Product Order Identifier as specified in Table 32 in their Retrieve Product Order by Product Order Identifier request.

9.8.2 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.

[R103] The Seller's response **MUST** comply with the states and attributes detailed in Table 56 and Table 57.

In Table 56 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".

	ACKNOWLEDGED	ASSESSING_CANCELLATION	ASSESSING_CHARGE	CANCELLED	CANCELLING	COMPLETED	FAILED	IN_PROGRESS	PARTIAL	REJECTED
Product Order Identifier	R	R	R	R	R	R	R	R	R	R
Buyer Product Order Identifier	E	E	E	E	E	E	E	E	E	E
Product Order Create Date	R	R	R	R	R	R	R	R	R	R
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
Product Order Contact	E	E	E	E	E	E	E	E	E	E
Seller Contact	R	R	R	R	R	R	R	R	R	R
Cancellation Reason				E - Buyer R- Seller						
Product Order Cancellation Date				R						
Cancel Product Order Charge				PR	PR					
Product Order Final State Date				R		R	R		R	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

Table 56 – Seller Response Product Order Attributes Based on Product Order State

In Table 57 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”, Optional to be provided by the Seller or the Buyer shown by an “O”, and blank cells indicate that the Seller must not fill this attribute in when in that state.

	ACKNOWLEDGED	CANCELLED	COMPLETED	FAILED	HELD	IN_PROGRESS	PENDING	REJECTED	UNASSESSED	VALIDATED
Product Order Item Reference Identifier	E	E	E	E	E	E	E	E	E	E
Product Order Item Product Action	E	E	E	E	E	E	E	E	E	E
Product Order Item Product Identifier	E	E	E - Buyer R- Seller when assigned	E	E	E	E	E	E	E
Product Order Item Product Offering Identifier	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
Place Relationship	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
Product Order Item Relationship	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
Product Relationship	E	E	E	E	E	E	E	E	E	E
Product Order Item 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
Product Order Item Requested Completion Date	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
Product Order Item Expedite Accepted Indicator	PR	PR	PR	PR	PR	PR	PR	PR	PR	PR
Related Charges		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
Buyer Product Order Item Contact	E	E	E	E	E	E	E	E	E	E
Buyer Implementation Contact	E	E	E	E	E	E	E	E	E	E
Buyer Technical Contact	E	E	E	E	E	E	E	E	E	E
Buyer Fault Contact	E	E	E	E	E	E	E	E	E	E
Seller Contacts	R	R	R	R	R	R	R	R	R	R
Product Order Item Failed Date				R						
Product Order Item Expected Completion Date						R				
Product Order Item Completion Date			R							
Product Order Item POQ Item	E	E	E	E	E	E	E	E	E	E
Product Order Item State	R	R	R	R	R	R	R	R	R	R

	ACKNOWLEDGED	CANCELLED	COMPLETED	FAILED	HELD	IN_PROGRESS	PENDING	REJECTED	UNASSESSED	VALIDATED
Product Order Item Quote Item	E	E	E	E	E	E	E	E	E	E
Requested Product Order Item Term	E	E	E	E	E	E	E	E	E	E
Product Order Item Term		PR	PR	PR	PR	PR	PR			PR
Related Buyer Purchase Product Order Number	E	E	E	E	E	E	E	E	E	E
Agreement Name	E	E	E	E	E	E	E	E	E	E
Buyer Billing Information	E	E	E	E	E	E	E	E	E	E

Table 57 – Seller Response Product Order Item Attributes Based on Product Order State

9.9 Retrieve Modify Product Order Item Requested Delivery Date List

This section defines the attributes and requirements associated with Retrieve Modify Product Order Item Requested Delivery Date List. This includes the Buyer's Retrieve Modify Product Order Item Requested Delivery Date List request and the Seller's Retrieve Modify Product Order Item Requested Deliver Date List response.

9.9.1 Buyer Retrieve Modify Product Order Item Requested Delivery Date List Request

This section defines the attributes and requirements for the Buyer's Retrieve Modify Product Order Item Requested Delivery Date List request.

[O18] The Buyer's Retrieve Modify Product Order Item Requested Delivery Date List request **MAY** contain none or any of the following attributes as defined in Table 36:

- Product Order Identifier
- Product Order Item Expedite Indicator
- Product Order Item Requested Completion Date (range of dates)
- Modify Product Order Item Requested Delivery Date State
- Modify Product Order Item Requested Delivery Date Create Date (range of dates)

9.9.2 Seller Retrieve Modify Product Order Item Requested Delivery Date List Response

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

[R104] If the Seller Response Code indicates success, the Seller's response to the Buyer's Retrieve Modify Product Order Item Requested Delivery Date List request **MUST** contain the following for each Modify Product Order Item Requested Delivery Date that matches the filter criteria:

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

- Modify Product Order Item Requested Delivery Date State

[R105] If the Seller Response Code indicates success but no matching Modify Product Order Item Requested Delivery Date are found, the Seller **MUST** return an empty list.

[R106] If the Seller Response Code does not indicate success, the Seller **MUST NOT** reply with any of the attributes in Table 36.

9.10 Retrieve Modify Product Order Item Requested Delivery Date by Modify Product Order Item Requested Delivery Date Identifier

This section defines the attributes and requirements associated with Retrieve Modify Product Order Item Requested Delivery Date by Modify Product Order Item Requested Delivery Date Identifier.

9.10.1 Buyer Retrieve Modify Product Order Item Requested Delivery Date by Modify Product Order Item Requested Delivery Date Identifier Request

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

[R107] The Buyer **MUST** include the Modify Product Order Item Requested Delivery Date Identifier as specified in Table 36 in their Retrieve Modify Product Order Item Requested Delivery Date by Modify Product Order Item Requested Delivery Date Identifier request.

9.10.2 Seller Retrieve Modify Product Order Item Requested Delivery Date by Modify Product Order Item Requested Delivery Date Identifier Response

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

[R108] If the Seller Response Code indicates success and a matching Modify Product Order Item Requested Delivery Date Identifier is found, the Seller's response **MUST** include the following attributes as shown in Table 36:

- Modify Product Order Item Requested Delivery Date Identifier
- Modify Product Order Item Requested Delivery Date Create Date
- Product Order Identifier
- Product Order Item Reference Identifier
- Product Order Item Expedite Indicator

- Product Order Item Requested Completion Date
- Modify Product Order Item Requested Delivery Date State

[R109] If the Seller Response Code does not indicate success, the Seller **MUST NOT** reply with any of the attributes in Table 36.

9.11 Retrieve Cancel Product Order List

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

9.11.1 Buyer Retrieve Cancel Product Order List Request

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

[O19] The Buyer's Retrieve Cancel Product Order List request **MAY** include none or any of the following attributes as defined in Table 37:

- Product Order Identifier
- Cancel Product Order State
- Cancellation Reason Type

9.11.2 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.

[R110] The Seller's response to the Buyer's Retrieve Cancel Product Order List request **MUST** contain the following from Table 37 for each Cancel Product Order that matches the filter criteria:

- Cancel Product Order Identifier
- Product Order Identifier
- Cancel Product Order State
- Cancellation Reason Type

[R111] If the Seller Response Code indicates success but no matching Cancel Product Order are found, the Seller **MUST** return an empty list.

[R112] If the Seller Response Code does not indicate success, the Seller **MUST NOT** reply with any of the attributes in Table 37.

9.12 Retrieve Cancel Product Order by Cancel Product Order Identifier

This section defines the attributes and requirements associated with Retrieve Cancel Product Order by Cancel Product Order Identifier.

9.12.1 Buyer Retrieve Cancel Product Order by Cancel Product Order Identifier Request

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

[R113] The Buyer **MUST** include the Cancel Product Order Identifier as specified in Table 37 in their Retrieve Cancel Product Order by Cancel Product Order Identifier request.

9.12.2 Seller Retrieve Cancel Product Order by 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 Cancel Product Order Identifier request.

[R114] The Seller's response **MUST** include the attributes per Cancel Product Order as shown below:

- Cancel Product Order Identifier
- Product Order Identifier
- Cancel Product Order State
- Cancel Product Order Contact
- Cancel Product Order Seller Contact
- Cancellation Reason Type
- Cancellation Reason
- Cancellation Denied Reason

9.13 Retrieve List of Charges

This section defines the attributes and requirements associated with Retrieve List of Charges. This includes the Buyer's Retrieve List of Charges request and the Seller's Retrieve List of Charges response.

9.13.1 Buyer Retrieve List of Charges Request

This section defines the attributes and requirements for the Buyer's Retrieve List of Charges request.

[O20] The Buyer's Retrieve List of Charges request **MAY** contain none or more of the following attributes as defined in Table 48:

- Product Order Identifier
- Product Order Item Reference Identifier
- Response Due Date (range of dates)
- Charge State
- Charge Creation Date (range of dates)

9.13.2 Seller Retrieve List of Charges Response

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

[R115] If the Seller Response Code indicates success but no matching Charges are found, the Seller **MUST** return an empty list.

[R116] If the Seller Response Code indicates success, the Seller's response to the Buyer's Retrieve List of Charges request **MUST** contain the following attributes from Table 48 for each Charge that matches the filter criteria:

- Charge Identifier
- Charge Creation Date
- Product Order Identifier
- Product Order Item Reference Identifier
- Charge State
- Response Due Date

[R117] If the Seller Response Code does not indicate success, the Seller **MUST NOT** reply with any of the attributes in Table 48.

9.14 Retrieve Charge by Charge Identifier

This section defines the attributes and requirements associated with Retrieve Charge by Charge Identifier. This includes the Buyer's Retrieve Charge by Charge Identifier request and the Seller's Retrieve Charge by Charge Identifier Charge response.

9.14.1 Buyer Retrieve Charge by Charge Identifier Charge Request

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

[R118] The Buyer **MUST** include the Charge Identifier as specified in Table 48 in their Retrieve Charge by Charge Identifier request.

9.14.2 Seller Retrieve Charge 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.

[R119] The Seller's response **MUST** include all the applicable attributes as shown in Table 48 and Table 49.

Note: There are attributes in these tables that are exclusive based on the request type and the action. The appropriate attributes are used.

9.15 Register for Notifications

This section defines the attributes and requirements associated with the Register for Notifications (Use Case 15). This includes the Buyer's Register for Notifications request and the Seller's Register for Notifications response.

9.15.1 Buyer Register for Notifications Request

This section defines the attributes and requirements for the Buyer's Register for Notifications request.

[R120] The Seller **MUST** support registration for Notification Type CHARGE_CREATE if Charge related Use Cases are supported.

[R121] The Buyer **MUST** register for Notifications with Notification Type CHARGE_CREATE if supported by the Seller.

[O21] The Seller **MAY** support registration for Notification Types other than CHARGE_CREATE.

[CR7]<[O21] 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 44.

[CR8]<[O21] 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.

9.15.2 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.

9.16 Seller Send Notification

This section defines the attributes and requirements associated with the Seller Notification Use Case (Use Case 16). 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.

- [R122] The Seller **MUST NOT** send Notifications to Buyers for Notification Types for which the Buyer has not registered.
- [R123] The Seller **MUST** send Notifications to Buyers for Notification Types for which the Buyer has registered.
- [R124] Notifications **MUST** include all Attributes shown in Table 58.
- [O22] The Seller **MAY** support sending MILESTONE notifications.
- [CR9]<[O22] If the Seller supports sending MILESTONE notifications, the Buyer **MUST** maintain the history of MILESTONES.

Notification Type	Mandatory Attributes	Comments
CANCEL_PRODUCT_ORDER_STATE_CHANGE	Seller Object Identifier Seller Object Identifier Type	
CHARGE_CREATE	Seller Object Identifier Seller Object Identifier Type	
CHARGE_STATE_CHANGE	Seller Object Identifier Seller Object	

Notification Type	Mandatory Attributes	Comments
	Identifier Type	
CHARGE_TIMEOUT	Seller Object Identifier Seller Object Identifier Type	
MODIFY_PRODUCT_ORDER_ITEM_REQUESTED_DELIVERY_DATE_STATE_CHANGE	Seller Object Identifier Seller Object Identifier Type	
PRODUCT_ORDER_ITEM_EXPECTED_COMPLETION_DATE_SET	Seller Object Identifier Item Reference Identifier Seller Object Identifier Type	
PRODUCT_ORDER_STATE_CHANGE	Seller Object Identifier Seller Object Identifier Type	
PRODUCT_ORDER_ITEM_STATE_CHANGE	Seller Object Identifier Item Reference Identifier Seller Object Identifier Type	

Notification Type	Mandatory Attributes	Comments
PRODUCT_SPECIFIC_PRODUCT_ORDER_ITEM_MILESTONE	Seller Object Identifier Item Reference Identifier Seller Object Identifier Type Milestone Name	

Table 58 – Notification Attributes by Notification Type

[R125] Based in the Seller Object Identifier Type, the Seller **MUST** provide the Identifier as shown in Table 59.

Seller Object Identifier Type	Identifier	Comments
PRODUCT_ORDER	Product Order Identifier	
CANCEL_PRODUCT_ORDER_IDENTIFIER	Cancel Identifier	
CHARGE	Charge Identifier	
MODIFY_PRODUCT_ORDER_ITEM_REQUESTED_DELIVERY_DATE	Modify Product Order Item Requested Delivery Date Identifier	

Table 59 – Seller Object Identifier to Seller Object Identifier Type

9.17 Specifying the Buyer Identifier and the Seller Identifier

For an explanation of the use of the Seller and Buyer Identifiers please see MEF 79 [7] section 8.8.

10 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, Modify Product Order Item Requested Completion Date, Cancel Process, and Charge states during the lifecycle of Product Ordering.

10.1 Product Order State Machine

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

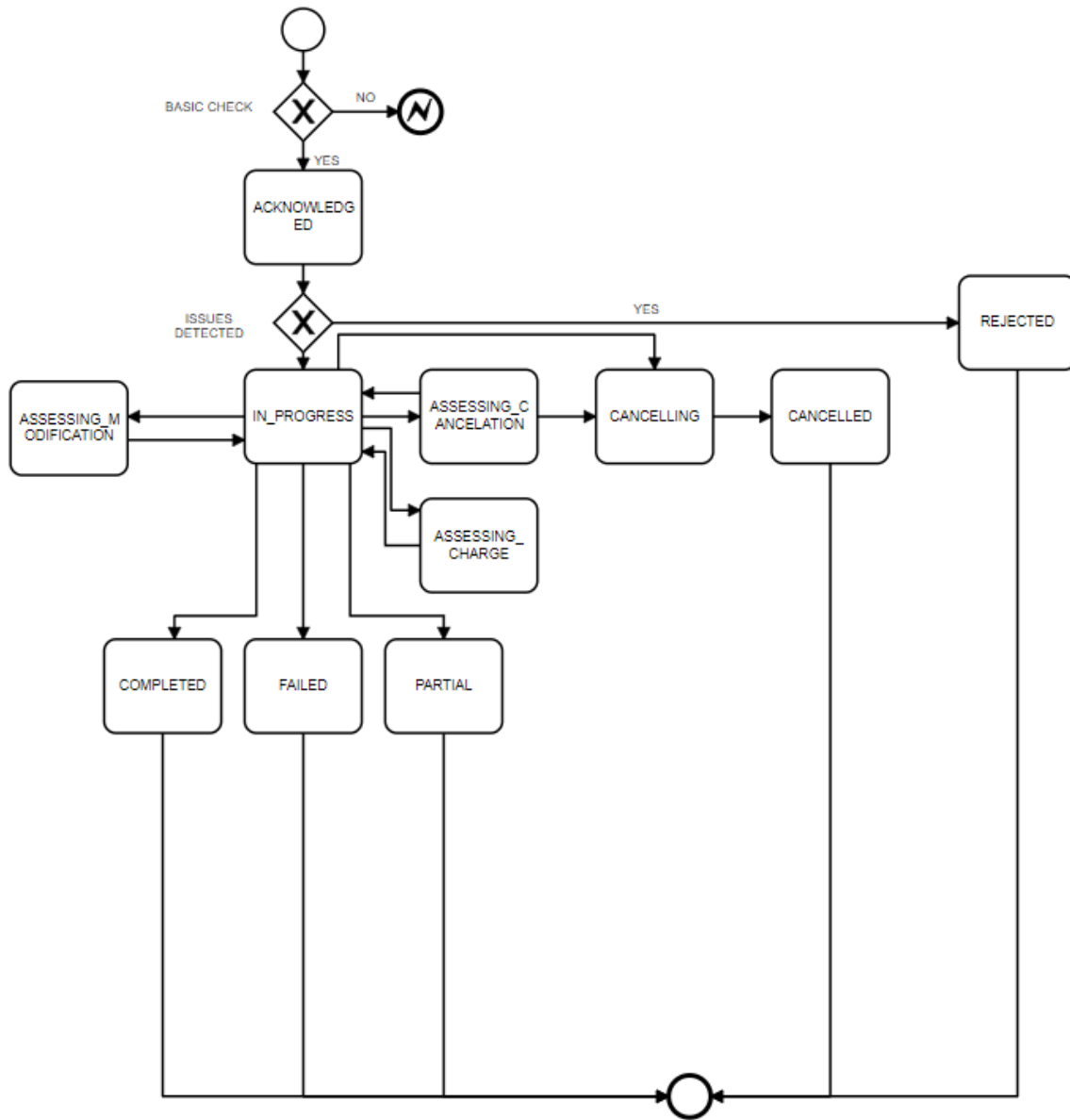


Figure 6 – Product Order Process Flow

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 Cancel Product Order request has been received by the Seller. The Product Order is being assessed to determine if the Product Order can be cancelled. If there are charges associated with cancelling the Product Order, these are communicated to the Buyer using the Charge process. The Product Order remains in the ASSESSING_CANCELLATION state until any relevant Charge is completed or withdrawn by the Seller. Once the Buyer's Cancel Product Order request has been validated and any associated Charges completed, the Product Order moves to the CANCELLED state. If the Cancel Product Order request is not validated or if any associated Charges are not completed, the Product Order moves to the IN_PROGRESS state and the Product Order is not cancelled.
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 IN_PROGRESS and then 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 Requested Delivery Date is valid. If there is a charge associated with the Modify Product Order Item Requested Delivery 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 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 60 – Product Order Process Flow States

10.2 Product Order Item State Machine

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

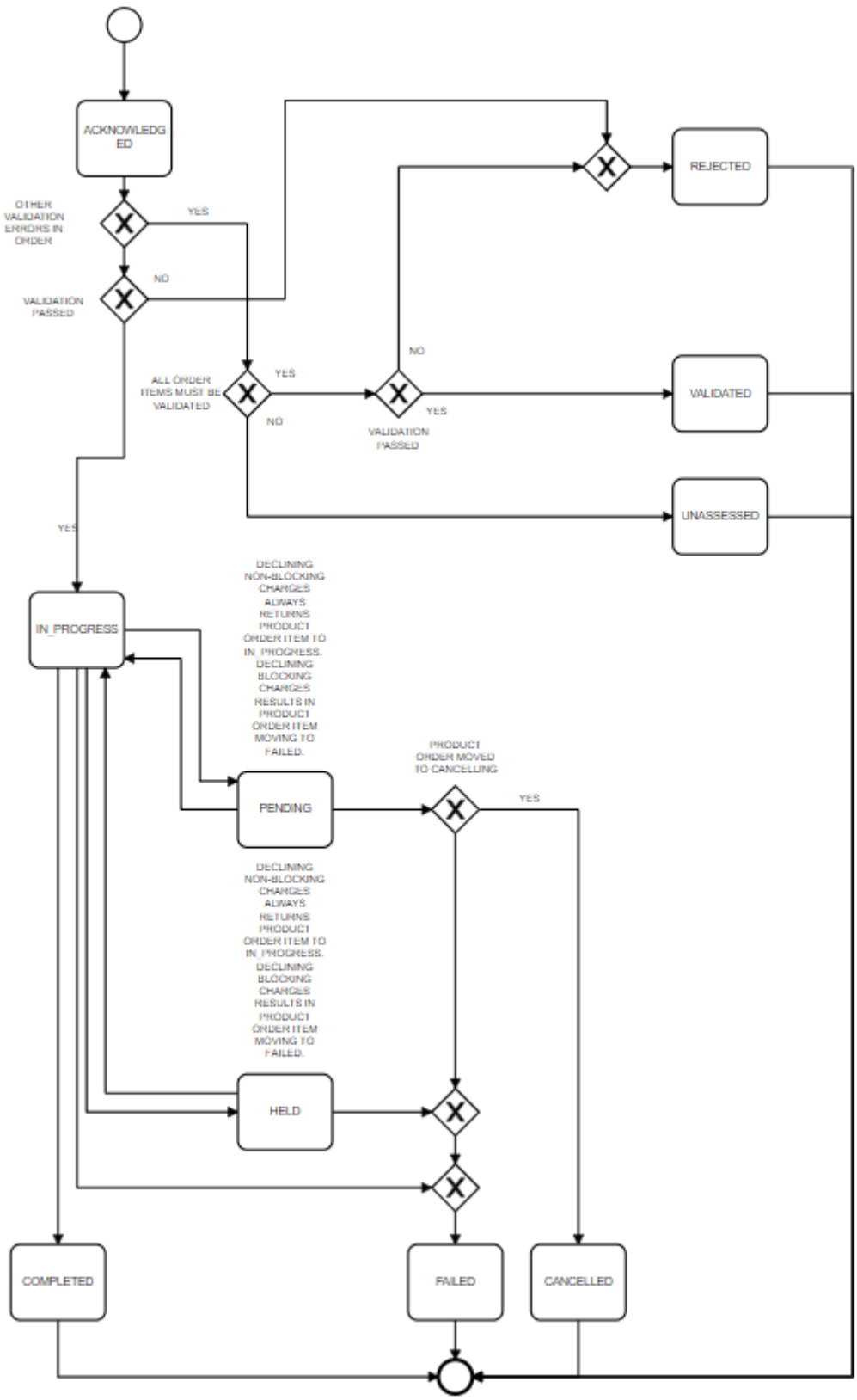


Figure 7 – Sonata Product Order Item Process Flow

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 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 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.

State	Description
PENDING	The Product Order Item cannot be progressed due to the Seller assessing a Cancel Product Order or Modify Product Order Item Requested Delivery Date request. The Seller stops work on the Product Order Item until either the Cancel Product Order has been accepted, 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 Requested Delivery Date has been accepted and the Product Order Item State moves to IN_PROGRESS, or the Modify Product Order Item Requested Delivery Date moves to DECLINED and the Product Order Item state moves to IN_PROGRESS with original delivery dates.
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 61 – Product Order Item Process Flow States

10.3 Modify Product Order Item Requested Delivery Date State Machine

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

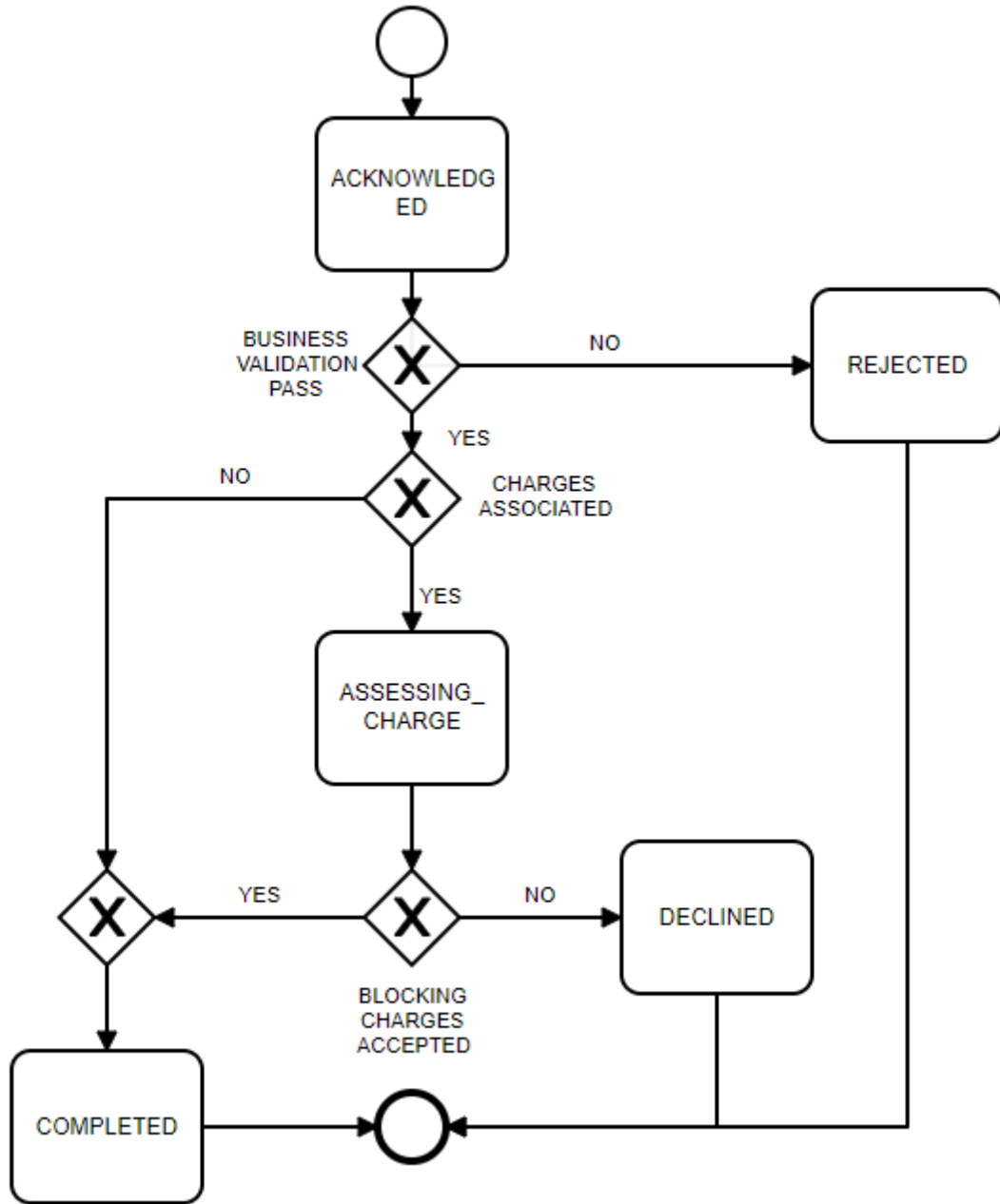


Figure 8 – Modify Product Order Item Requested Delivery Date Process Flow

State	Description
ACKNOWLEDGED	A Modify Product Order Item Requested Delivery Date request has been received and has passed basic validation. The Modify Product Order Item Requested Delivery Date Identifier is assigned in the ACKNOWLEDGED state. Validation of Modify Product Order Item Requested Delivery Date attributes as applicable is completed in the ACKNOWLEDGED state.
ASSESSING_CHARGE	When the Modify Product Order Item Requested Delivery Date request results in a Charge being initiated by the Seller. The Modify Product Order Item Requested Delivery 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 Requested Delivery Date are considered Blocking charges. If any charge is not accepted by the Buyer, the Modify Product Order Item Requested Delivery Date moves from the ASSESSING_CHARGE state to the DECLINED state.
COMPLETED	A Modify Product Order Item Requested Delivery Date request has been received, passed all validations, if a Charge is associated all Charge Items have been accepted by the Buyer, the Expedite Indicator is set as requested, and the Product Order Item Requested Completion Date has been updated as requested.
DECLINED	Blocking charges associated with a Modify Product Order Item Requested Delivery Date have been declined by the Buyer. No updates are made to the Product Order Item.
REJECTED	A Modify Product Order Item Requested Delivery 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 62 – Modify Product Order Item Requested Delivery Date Process Flow States

10.4 Cancel Product Order State Machine

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

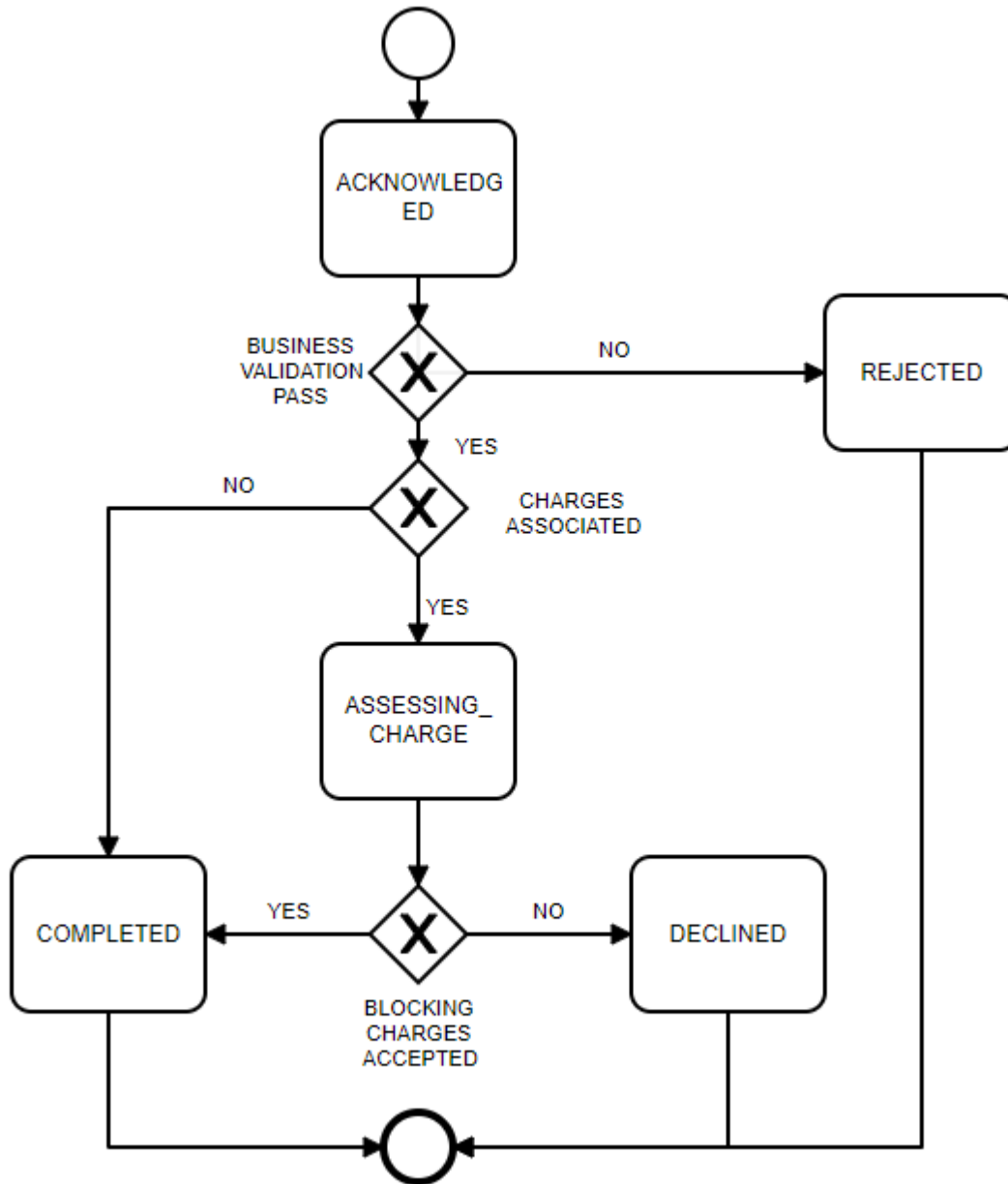


Figure 9 – Cancel Product Order Process Flow

State	Description
ACKNOWLEDGED	A Cancel Product Order request has been received and has passed basic validation. Cancel Product Order Identifier is assigned in the ACKNOWLEDGED state. Validation of Cancel Product Order attributes as applicable are completed during the ACKNOWLEDGED state.
ASSESSING_CHARGE	The Cancel Request results in a Charge being initiated by the Seller. The Cancel Product Order request remains in this state until the Charge is completed or withdrawn by the Seller.
COMPLETED	A Cancel Product Order 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 has been cancelled as requested.
DECLINED	Blocking charges associated with a Cancel Product Order have been declined by the Buyer. The Product Order is not cancelled.
REJECTED	A Cancel Product Order 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. The Product Order is not cancelled.

Table 63 – Cancel Process Flow States

10.5 Charge State Machine

The States and State Machine for the Charges are detailed in this section.

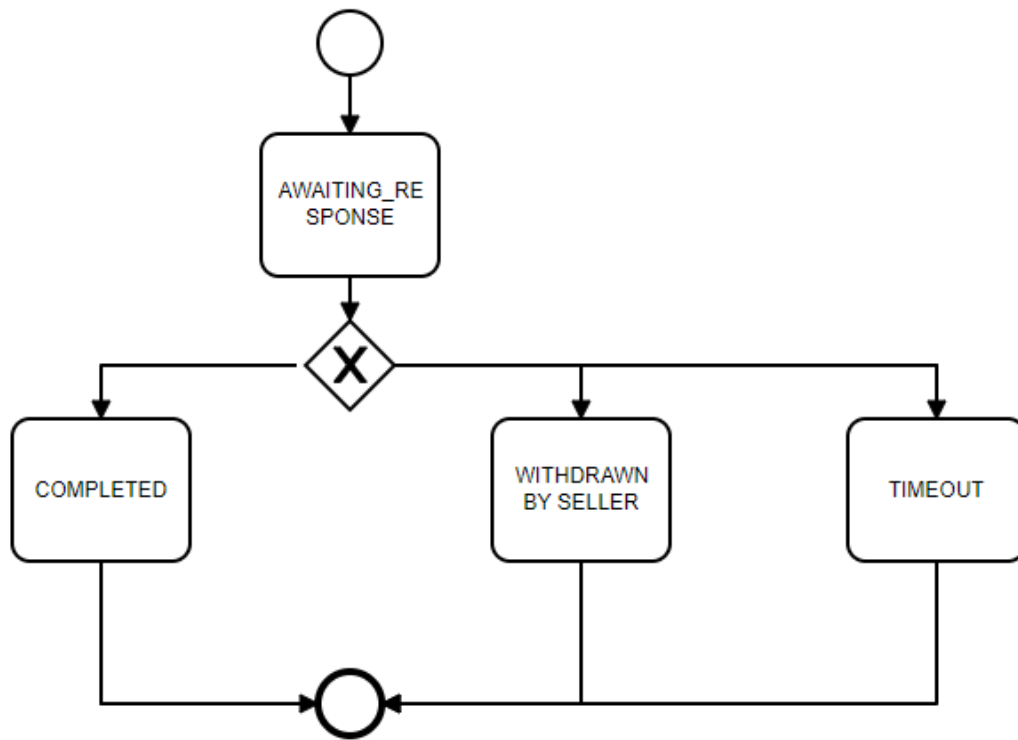


Figure 10 – Charge Flow

State	Description
AWAITING_RESPONSE	A Charge has been initiated by the Seller. The Charge includes one or more charges related to a Product Order or Product Order Item. Buyer has not indicated whether they accept or reject the charges via a Respond to Charge request.
COMPLETED	All Charge Items included in the Charge have moved to either the ACCEPTED_BY_BUYER state, the DECLINED_BY_BUYER state, or the WITHDRAWN_BY_SELLER state.
TIMEOUT	A Respond to Charge request has not been received from the Buyer within the specified period of time. This is treated as if the Buyer declined all the Charge Items of the Charge, and all Charge Items move to DECLINED_BY_BUYER state.
WITHDRAWN_BY_SELLER	The Seller determines that any of the Charge Items are incorrect. They withdraw the Charge and may initiate a new Charge with the required correction(s).

Table 64 – Charge Flow States

10.6 Charge Item State Machine

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

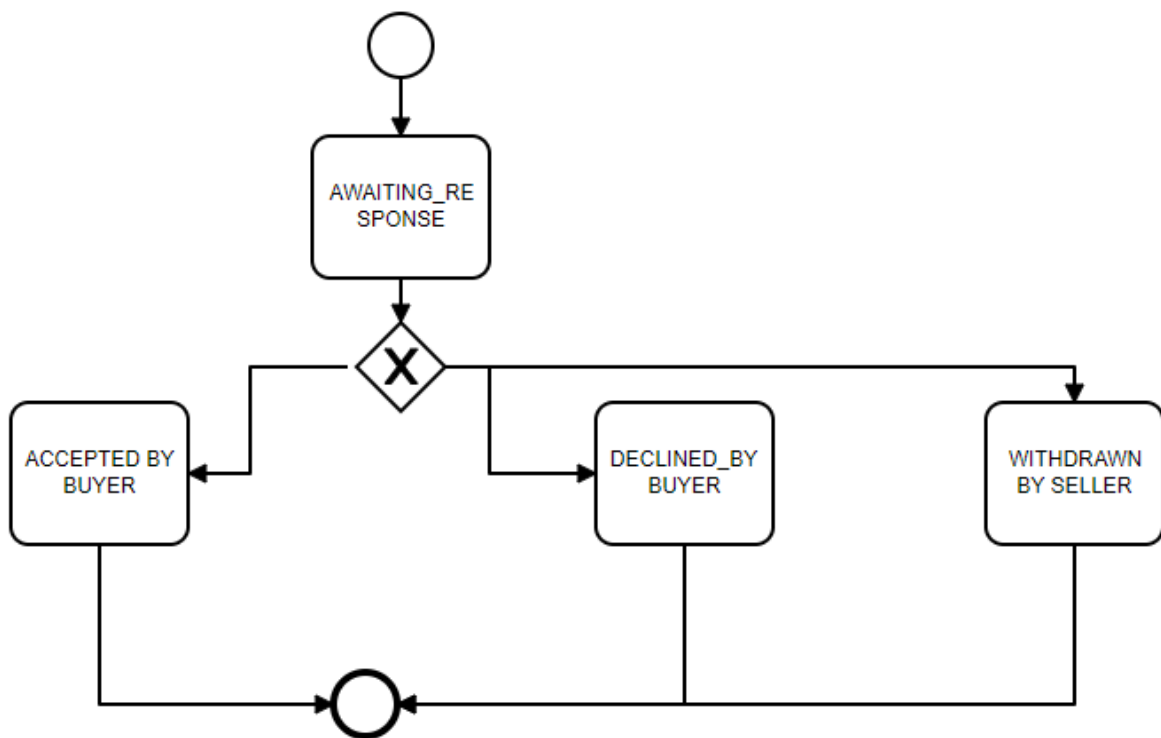


Figure 11 – Charge Item Process

State	Description
ACCEPTED_BY_BUYER	A Charge Item identified in the Charge has been accepted by the Buyer.
AWAITING_RESPONSE	The Buyer has not yet indicated for whether they accept or reject the charge indicated in the Charge Item via a Response to Charge request while the Response Due Date of the Charge Item’s Charge has not expired.
DECLINED_BY_BUYER	A Charge Item 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, the related Cancel Product Order, or the related Modify Product Order Item Requested Delivery Date.
WITHDRAWN_BY_SELLER	The Seller determines that the Charge Item is incorrect. They withdraw the Charge Item and initiate a new Charge with the required correction(s) if needed.

Table 65 – Charge Item Process Flow States

[R126] Once a Charge Item has been accepted by the Buyer, the Seller **MUST NOT** withdraw or modify the Charge Item.

11 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*, by S. Bradner, March 1997
- [3] IETF RFC 8174, *Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words*, by B. Leiba, May 2017, Copyright © 2017 IETF Trust and the persons identified as the document authors. All rights reserved.
- [4] MEF 50.1, MEF Forum, *MEF Services Lifecycle Process Flows*, August 2017.
- [5] MEF 51.1, MEF Forum, *Operator Services Definitions*, December 2018
- [6] MEF 55.1, MEF Forum, *LSO Reference Architecture*, January 2021.
- [7] MEF 79, *Address, Service Site, and Product Offering Qualification Management Requirements and Use Cases*, June 2019
- [8] MEF 79.0.2, *Amendment to MEF 79: Address Validation*, September 2020
- [9] MEF 80, *Quote Management Requirements and Use Cases*, July 2021
- [10] MEF 134, *Invoice Business Requirements and Use Cases*, May 2022
- [11] TMF622 TM Forum, *TMF622 Product Ordering API REST Specification R17.5.1*, May 2018.

Appendix A Process Timelines

This Appendix to the document contains Process Timelines that represent how different processes interact with each other and with time. These are meant to be informative.

A.1 Modify Product Order Item Requested Delivery Date

The following examples reflect how a Modify Product Order Item Requested Delivery Date request impacts a Product Order that is in the IN_PROGRESS state.

A.1.1 Expedite Indicator

The impact of requesting that the Expedite Indicator be modified is shown in Figure 12.

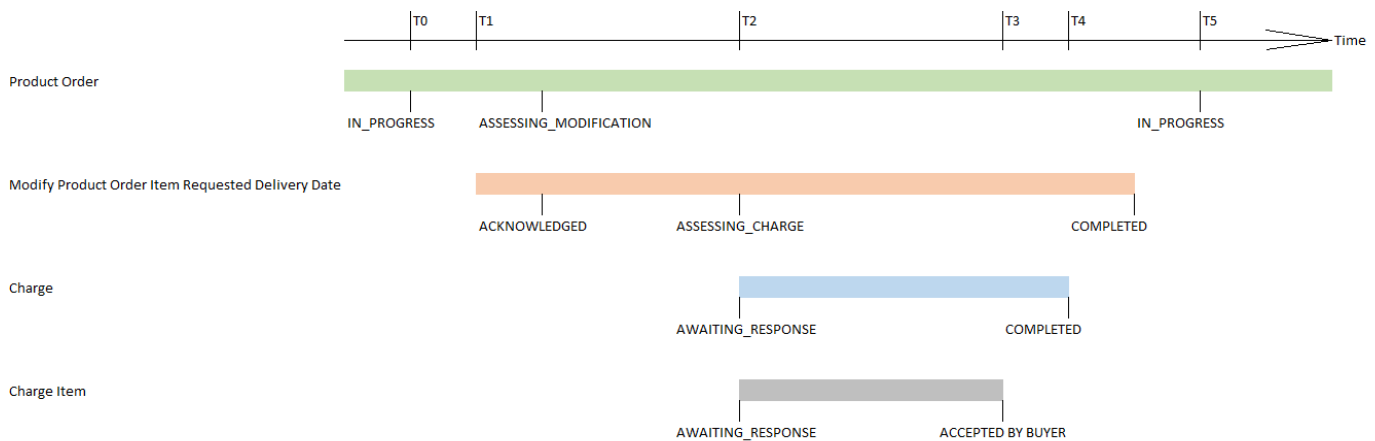


Figure 12 – Expedite Indicator Impact

Figure 12 reflects a Product Order that is IN_PROGRESS shown by the green line. The Buyer submits a Modify Product Order Item Requested Delivery Date with the Expedite Indicator set to TRUE at time T1. The Seller acknowledges the request, returning the Modify Product Order Item Requested Delivery Date Identifier to the Buyer, and places the Product Order into the ASSESSING_MODIFICATION state. At time T2 the Seller determines that there is a Charge associated with expediting a Product Order Item of the Product Order. The CHARGE_CREATE notification is sent to the Buyer by the Seller. The Buyer then can retrieve the details of the Charge by sending a Retrieve Charge by Charge Identifier request.

Once the Buyer has the details of the Charge, they can determine if they are going to accept or decline the Charge Items related to the Charge. In this example, the Buyer accepts the Charge Item(s) at T3. The Seller moves the Charge Item state to ACCEPTED_BY_BUYER and moves the Charge state to COMPLETED at T4. As the Modify Product Order Item Requested Delivery Date moves to the COMPLETED state, the Seller updates the Expedite Indicator in a Product Order Item of the Product Order and moves the Product Order to the IN_PROGRESS state.

A.1.2 Requested Completion Date

The impact of requesting that the Requested Completion Date be modified is shown in Figure 13.

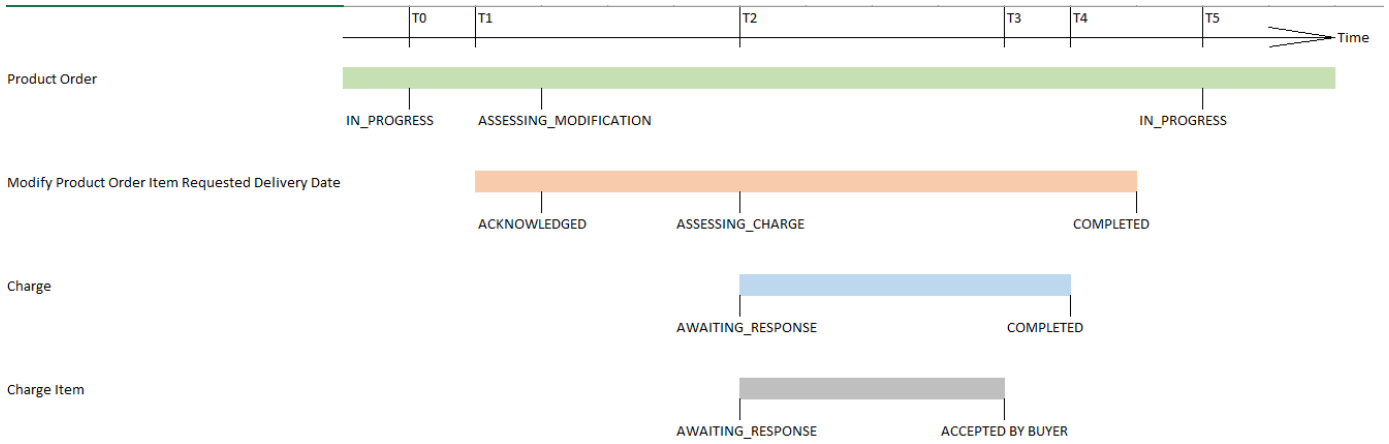


Figure 13 – Modifying Requested Completion Date Impact

Figure 13 reflects a Product Order that is `IN_PROGRESS` shown by the green line. The Buyer submits a `Modify Product Order Item Requested Delivery Date` with the Requested Completion Date later than the original date in the Product Order at time T1. The Seller acknowledges the request, returning the `Modify Product Order Item Requested Deliver Date Identifier` to the Buyer, and places the Product Order into the `ASSESSING_MODIFICATION` state. At time T2 the Seller determines that there is a Charge associated with changing the requested completion date of a Product Order Item of the Product Order. The `CHARGE_CREATE` notification is sent to the Buyer by the Seller. The Buyer then can retrieve the details of the Charge by sending a `Retrieve Charge by Charge Identifier` request.

Once the Buyer has the details of the Charge, they can determine if they are going to accept or decline the Charge Items related to the Charge. In this example, the Buyer accepts the Charge Item(s) at T3. The Seller moves the Charge Item state to `ACCEPTED_BY_BUYER` and moves the Charge state to `COMPLETED` at T4. As the `Modify Product Order Item Requested Deliver Date` moves to the `COMPLETED` state, the Seller updates the Requested Completion Date in a Product Order Item of the Product Order and moves the Product Order to the `IN_PROGRESS` state.

A.2 Cancel Product Order

The following examples reflect how a `Cancel Product Order` request impacts a Product Order that is in the `IN_PROGRESS` state. The impact of requesting that the Product Order be cancelled is shown in Figure 14.

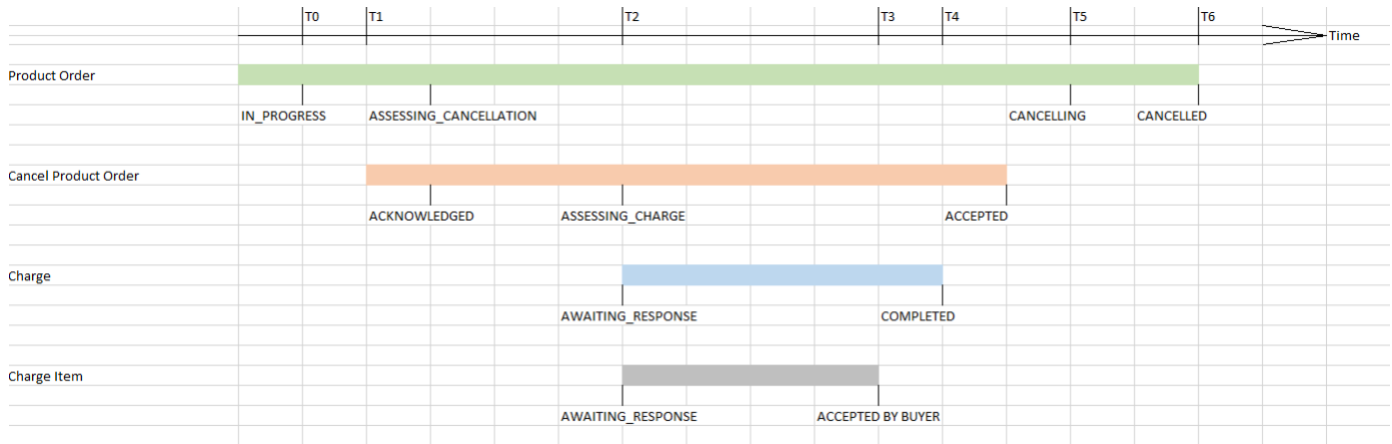


Figure 14 – Cancel Product Order Impact

Figure 14 reflects a Product Order that is IN_PROGRESS shown by the green line. The Buyer submits a Cancel Product Order request at time T1. The Seller acknowledges the request, returning the Cancel Product Order Identifier to the Buyer, and places the Product Order into the ASSESSING_CANCELLATION state. At time T2 the Seller determines that there is a Charge associated with cancelling the Product Order. The CHARGE_CREATE notification is sent to the Buyer by the Seller. The Buyer then can retrieve the details of the Charge by sending a Retrieve Charge by Charge Identifier request.

Once the Buyer has the details of the Charge, they can determine if they are going to accept or decline the Charge Items related to the Charge. In this example, the Buyer accepts the Charge Item(s) at T3. The Seller moves the Charge Item state to ACCEPTED_BY_BUYER and moves the Charge state to COMPLETED at T4. As the Cancel Product Order moves to the ACCEPTED state, the Seller moves the Product Order to the CANCELLING state. Once all internal work is done by the Seller to cancel the Product Order, they move the Product Order to the CANCELLED state and stop work on Product Order fulfillment.

Note that cancelling a Product Order stops fulfillment on all associated Product Order Items as well.

A.3 Product Order Item Charge

The following examples reflect how a Charge identified by the Seller impacts a Product Order that is in the IN_PROGRESS state. The impact of initiating the Charge is shown in Figure 15.

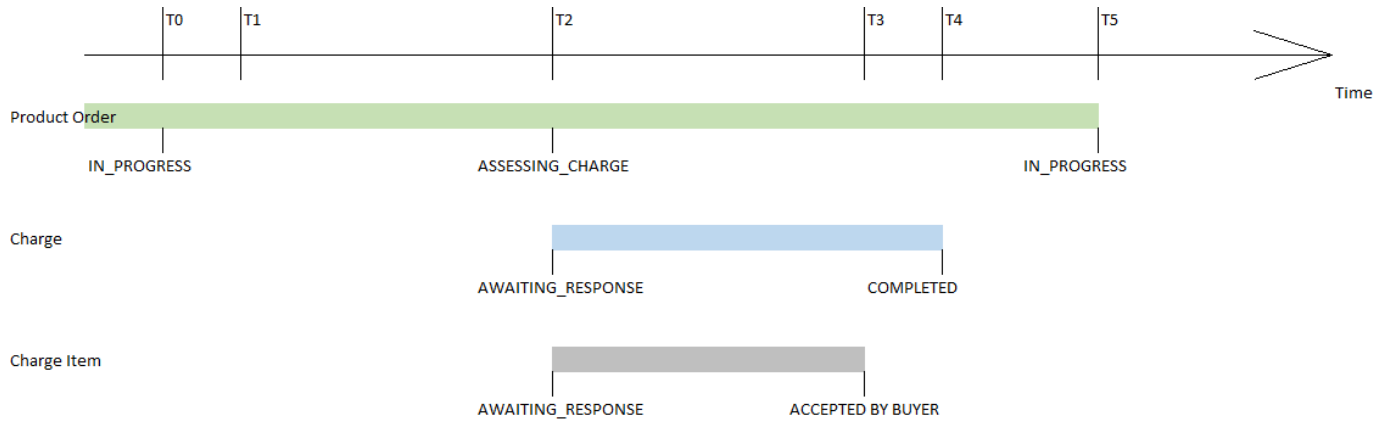


Figure 15 – Initiate Charge Impact

Figure 15 reflects a Product Order that is `IN_PROGRESS` shown by the green line. At time T_2 the Seller determines that there is a Charge associated with the Product Order Item. The `CHARGE_CREATE` notification is sent to the Buyer by the Seller and the Seller moves the Product Order to the `ASSESSING_CHARGE` state. The Buyer then can retrieve the details of the Charge by sending a Retrieve Charge by Charge Identifier request.

Once the Buyer has the details of the Charge, they can determine if they are going to accept or decline the Charge Items related to the Charge. In this example, the Buyer accepts the Charge Item(s) at T_3 . The Seller moves the Charge Item state to `ACCEPTED_BY_BUYER` and moves the Charge state to `COMPLETED` at T_4 . The Seller moves the Product Order to the `IN_PROGRESS` state and work on Product Order fulfillment continues.