Draft Standard
MEF 57.2 Draft (R3)

Product Order Management
Requirements and Use Cases

January 2022

This draft represents MEF work in progress and is subject to change.

This draft document represents MEF work in progress; it has not achieved full MEF standardization and is subject to change. Changes are likely before this becomes a fully endorsed MEF Standard. The reader is strongly encouraged to keep this in mind and review the Release Notes (if applicable) when making a decision on adoption. Additionally, because this document has not been adopted as a Final Specification in accordance with MEF's Bylaws, Members are not obligated to license patent claims that are essential to implementation of this document under MEF's Bylaws.

Disclaimer

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1 List of Contributing Members

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

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

- ABC Networks
- XYZ Communications

2 Abstract

This specification identifies the common Product Order Use Cases and attributes needed to support inter-carrier Product Order management. It supports the requirements defined in the MEF Lifecycle Service Orchestration (LSO) Reference Architecture and Framework (MEF 55.1 [5], "LSO RA") requirements for Product Order Management over the Sonata interface (Service Provider <-> Partner interactions). Requirements and Use Cases contained within this specification will be utilized by both Buyer and Seller Product Order systems for the development of APIs.

3 Release Notes

This document is still in the process of resolving comments from the last Call for Comments Ballot. Updates to those comments have not been made in this version. Because the comments are still being resolved, this document is subject to change. Areas that are expected to have changes in them are as follows:

- Use Case updates and additions

- Clarification of Charges and the related process

- Updates to Process Flows

- Numerous editorial changes

4   Terminology and Abbreviations

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

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

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

Term	Definition	Reference
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
Cancellation Charge	A charge set by the Seller that results from the cancellation of a Product Order.	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

Term	Definition	Reference
Point of No Return	A point in the fulfillment of a Product Order Item past which a Seller is unable or unwilling to accept a cancellation request on it. A Product Order is considered past the Point of No Return when all of its Product Order Items have reached their Point of No Return.	This document
Telecommunication Service Priority	A US centric term used to assign a priority for restoration of a Product in the event of a natural or other disaster impacting multiple Products.	This document

Table 1 – Terminology and Abbreviations

5   Scope

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

6 Compliance Levels

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

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

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

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

7 Introduction

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

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

To fully define the business interactions associated with inter-carrier Product Ordering, this document is focused on the following key areas: section 8 defines the Use Cases and Product Order Management Scenarios, section 9 defines the specific Product Ordering attributes associated with the Product Orders supported in this document, and section 11 provides the State Diagrams for Product Ordering.
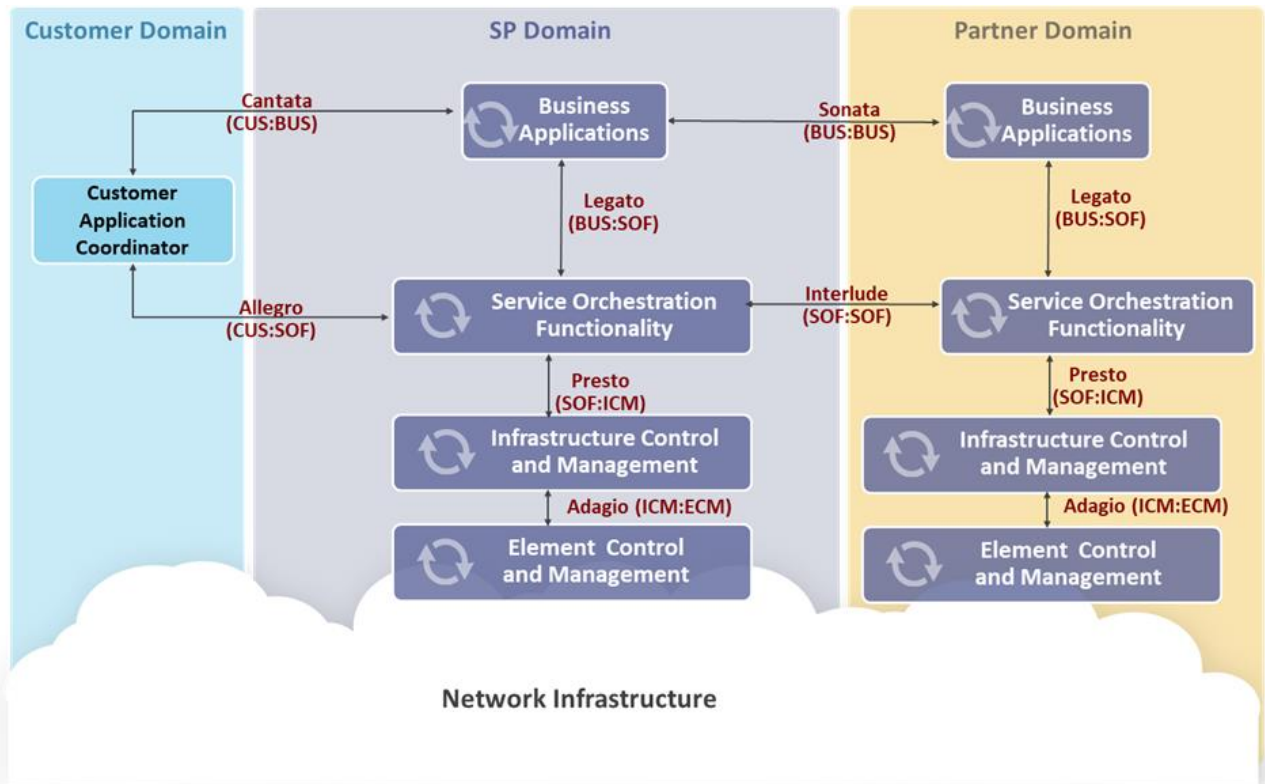
Figure 1 – LSO Reference Architecture Diagram

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

7.1 Product Specific Attributes

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

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

8 Product Ordering Use Cases and Business Process Definitions

8.1 High Level Use Cases

This section provides the complete set of Use Cases needed to support the Product Ordering of services and expands on the Product Ordering process defined in MEF 50.1 [4]. These Use Cases are based on business process standards of interactivity between Product Ordering entities and suppliers.   Each use case drives the need for specific Product Ordering information, and administrative process tracking objects. The specific attributes associated with each Use Case are defined in section 9. There are mandatory use cases and optional use cases.

> **[R1]** An implementation of the Sonata 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, and 14 **MUST** be supported.

> **[CR4]**<[O1] If Use Cases 15 or 16 are supported then 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 and services available for each Buyer. The requirements for how a catalog is used within the Product Ordering process are outside the scope of this document.

8.2 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.
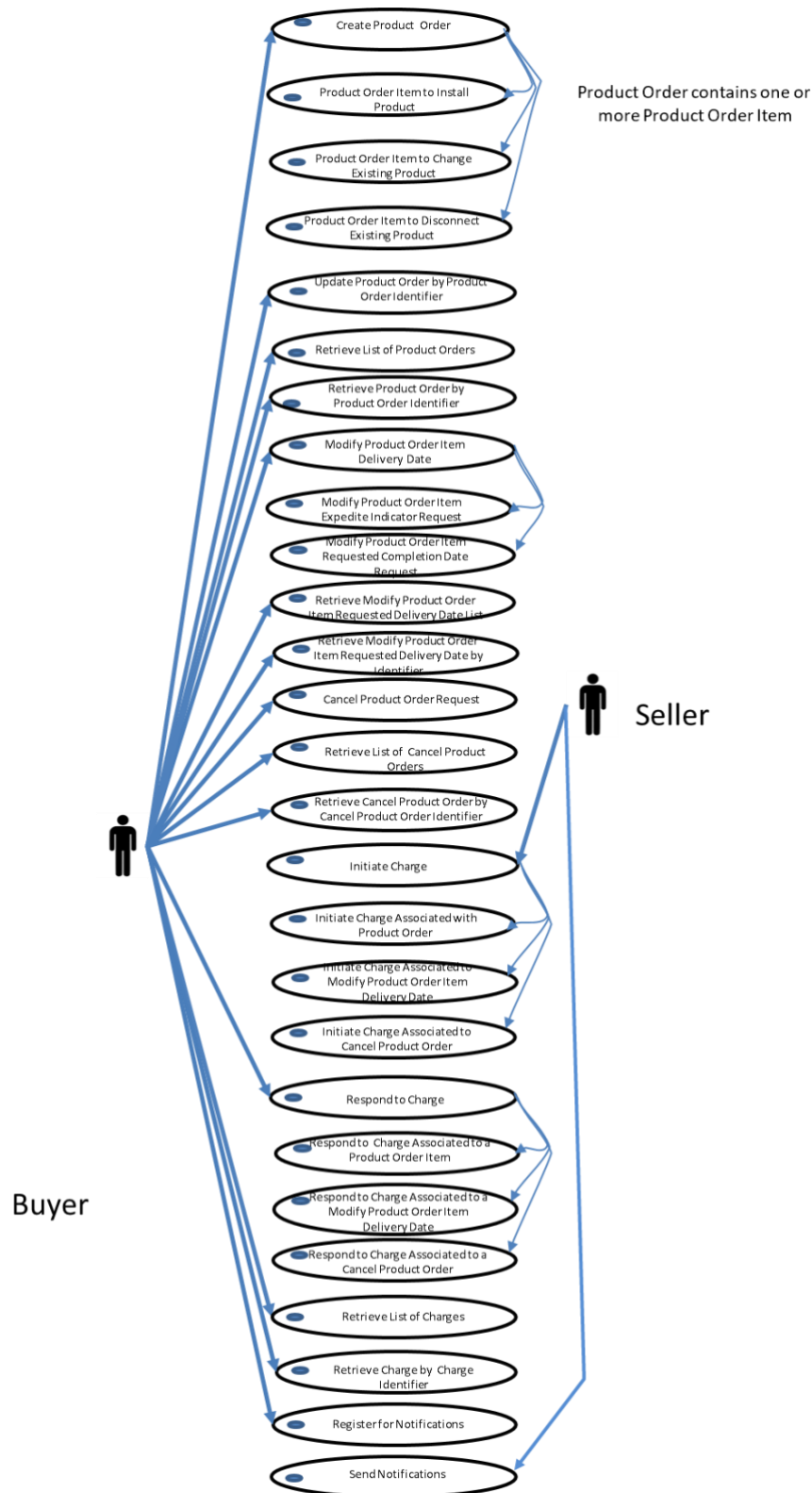
Figure 2 – Product Order Use Cases

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 Delivery Date	A request initiated by the Buyer to modify the delivery date of a Product Order Item.	Optional

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

Use Case #	Use Case Name	Use Case Description	Mandatory or Optional
	Product Order Item Delivery Date	specific Modify Product Order Item Delivery Date	
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.	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 to a Product Order Item	Optional
12-b	Respond to Charge Associated to a Modify Product Order Item Delivery Date	A Buyer communicates to the Seller if they Accept, or Decline Charge Items associated to a Modify Product Order Item 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 to 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 Product Orders, Cancel Product Orders, Charges, or Modify Product Order Item Delivery Date.	Optional
16	Send Notification	A notification initiated by the Seller to the Buyer providing subsequent status information on	Optional

Use Case #	Use Case Name	Use Case Description	Mandatory or Optional
		Product Order, Cancel Product Order, Modify Product Order Item Delivery Date, and Charges.	

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 structure of a Product Order (possible combinations of Product Order Items) is defined in Seller Product Order Management system.
- Relationships of Product Offerings are defined in Product Catalog and will be covered in a separate document.

For all of 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 Delivery Dates, accept Charges, and Cancel Product Orders.

8.2.1 Create Product Order Use Cases

The following Use Cases are described in this section:

- Create Product Order

  o Product Order Item to Install Product

  o Product Order Item to Change Existing Product

  o 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

8.2.1.1 *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	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	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 provides a response with an assigned Seller Product Order Identifier. 6. The state of the Product Order is set to "ACKNOWLEDGED" by the Seller.
Post-Conditions	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 expected date by which the requested product will be delivered. 4. Additional notifications are provided during the life of the Product Order.
Alternative Paths		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 New Product Order request is agreed to by the Buyer and Seller.

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

In some cases, the actions of related Product Order Items need to be coordinated as agreed to by the Buyer and Seller. The Product Actions may be the same or different actions 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	1. A Product Order Item with the Product Order Item Action of INSTALL and including the Product Offering Identifier for the product being Product Ordered is included in a Create New Product Order request. 2. The Seller validates the Product Order Item. 3. The state of the Product Order Item is set to "ACKNOWLEDGED" by the Seller.

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	1. The Buyer submits a Create New Product Order Request with a Product Order Item with the Product Order Item Action of CHANGE and the Product to be changed. 2. The Seller validates the Product Order Items. 3. The Seller accepts the Create New Product Order Request and provides a response with an assigned Seller Product Order Identifier. The state of the Product Order is set to "ACKNOWLEDGED" by the Seller.

Table 5 – Product Order Item to Change Existing Product

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

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 delivery 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	1. The Buyer submits a Create New Product Order request with a Product Order Item with the Product Order Item Action of DISCONNECT and the Product to be disconnected. 2. The Seller validates the Create New Product Order request and Product Order Items. 3. The Seller accepts the Create New Product Order request and provides a response with an assigned Seller Product Order Identifier. The state of the Product Order is set to "ACKNOWLEDGED" by the Seller.

Table 6 – Product Order Item to Disconnect Existing Product

8.2.1.2 *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 during fulfillment.
Actors	Buyer, Seller
Pre-Conditions	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-Flight 3. If the Seller is updating a Product Order Item, it must be in-progress.
Process Steps	1. The Buyer submits an Update Product Order request as shown in sections 9.2.1 and 9.3.1, including the Product Order and/or Product Order Item Attributes that are to be updated with the current and desired Attribute values. 2. The Seller receives the request and 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 any existing Notes.

8.2.1.3 *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	1. The Buyer submits a Retrieve List of Product Order request as shown in section 10.7.1 including filter criteria the Seller should apply. 2. The Seller receives the request and validates the request. 3. The Seller determines if any Product Orders match the filter criteria in the request. 4. The Seller returns a list of summarized Product Order instances as specified in section 10.7.2
Post-Conditions	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 Seller Product Order Identifier.
Alternative Paths	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: • an empty list and message that indicates the result set is too large and submit a new more specific query or • a response that indicates the result is too large and includes a subset of the matching Product Orders. 3. If the query does not find any matching records, then the Seller responds with an indication of this result.

Table 8 – Retrieve List of Product Orders Use Case

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

8.2.1.4 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	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. Note: Any Product Order submitted by the Buyer that exists in the Seller's system must be able to be retrieved via the API
Process Steps	1. The Buyer initiates a Retrieve Product Order by Product Order Identifier request to the Seller using the Seller Product Order Identifier. 2. The Seller responds to the Retrieve Product Order by Product Order Identifier request with the up to date view of the Product Order and its associated Product Order Items as specified in Table 31, Table 32, and Table 34 and the Charge Identifier and state as specified in Table 48.
Post-Conditions	3. The Buyer has detailed information on the Product Order with the given Seller Product Order Identifier.
Alternative Paths	1. If errors are encountered, the Seller returns all identified errors in a reject response and the Buyer may submit a new query. 2. If the Product Order is not found, the Buyer must receive a response indicating this. 3. If the Buyer is not authorized to retrieve the Product Order, the Buyer must receive a response indicating this. 4. If the Seller has archived a Product Order after reaching a final state, the Seller may return an error because it is no longer possible to retrieve the Product Order.

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

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

8.2.2 Modify Product Order Item Delivery Date

The following Use Cases are contained in this section:

- Modify Product Order Item Delivery Date Request

  - Modify Product Order Item Expedite Indicator Request

  - Modify Product Order Item Requested Completion Date Request

- Retrieve List of Modify Product Order Item Delivery Date

- Retrieve Modify Product Order Item Delivery Date by Identifier

8.2.2.1 *Modify Product Order Item Delivery Date*

The Modify Product Order Item 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 Delivery Date
Description	A request initiated by the Buyer to modify the delivery date of a Product Order Item.
Actors	Buyer, Seller
Pre-Conditions	1. An In-Flight Product Order exists in the Seller's system. 2. The Buyer can modify Product Order Items within the Product Order. Buyers may only modify Product Order Items within Product Orders that they initiated.
Alternative Paths	1. The Seller returns an error message if an error is encountered while processing that prevents the Seller from completing the request. 2. The Seller may determine that the Product Order Item cannot be modified and may reject the request. The Seller sets the state of the Modify Product Order Item Delivery Date to REJECTED and returns the referenced Product Order to IN_PROGRESS.

Table 10 – Modify Product Order Item Delivery Date Use Case

Field	Description
Use Case #	5-a
Use Case Name	Expedite Indicator Request
Description	A request initiated by the Buyer to modify the Expedite Indicator of a Product Order Item.
Process Steps	1. The Buyer initiates a Modify Product Order Item Delivery Date Request setting the Expedite Indicator to TRUE. 2. The Seller validates the Modify Product Order Item Delivery Date Request. 3. Seller initiates the Modify Date process, sets the Modify Product Order Item Delivery Date state to ACKNOWLEDGED and the Seller assigns a unique Modify Product Order Item Delivery Date Identifier. 4. The Seller changes the state of the Product Order which contains the Product Order Item to ASSESSING_MODIFICATION. . 5. The Seller notifies the Buyer of any charges resulting from modifying the referenced Product Order while the Modify Product Order Item Delivery Date is in the ACKNOWLEDGED state. (See Charge as described in section 8.2.4 for details on this). 6. The Charge is completed, with the Charge Items ACCEPTED. 7. The Seller accepts the Modify Product Order Item Delivery Date. The Modify Product Order Item 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 state to IN_PROGRESS. 10. The Seller continues their work to fulfill the Product Order.
Post-Conditions	1. The Expedite Indicator and Expedite Accepted Indicator of the specified Product Order Item are updated. 2. Any associated charges are identified, and a Charge Process is completed. 3. The Modify Product Order item Delivery Date is completed.
Alternative Paths	1. If the Charge Item(s) related to the Expedite Indicator = TRUE is DECLINED by the Buyer, the Seller sets the Expedite Indicator to FALSE, moves the Modify Product Order Item Delivery Date to DECLINED, and returns the Product Order Item to IN_PROGRESS.

Table 11 – Modify Product Order Item Delivery Date (Expedite Indicator) Use Case

Field	Description
Use Case #	5-b
Use Case Name	Requested Completion Date Request
Description	A request initiated by the Buyer to modify the Requested Completion Date of a Product Order Item.
Process Steps	1. The Buyer initiates a Modify Product Order Item Delivery Date Request which includes the modified Product Order Item Requested Completion Date. 2. The Seller validates the Modify Product Order Item Delivery Date Request. 3. Seller initiates the Modify process, sets the Modify Product Order Item Delivery Date state to ACKNOWLEDGED, the Seller assigns a unique Modify Process Identifier, and changes the state of the referenced Product Order to ASSESSING_MODIFICATION. 4. The Seller notifies the Buyer of any charges resulting from modifying the referenced Product Order while the Modify Product Order Item Delivery Date is in the ACKNOWLEDGED state. (See Charge as described in section 8.2.4 for details on this). 5. The Seller accepts the Modify Product Order Item Delivery Date. The Modify Product Order Item Delivery Date is set to COMPLETED and Seller updates the Product Order Item Requested Completion Date. 6. The Seller sets the referenced Product Order state to IN_PROGRESS. 7. The Seller continues their work to fulfill the Product Order.
Post-Conditions	1. The Requested Completion Date of the specified Product Order Item is updated. 2. Any associated charges are identified, and the Charge Process is complete.

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

8.2.2.2 Retrieve Modify Product Order Item Delivery Date List

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

Field	Description
Use Case #	6
Use Case Name	Retrieve Modify Product Order Item Delivery Date List
Description	A request initiated by the Buyer to retrieve a list of Modify Product Order Item Delivery Dates that match the provided filter criteria.
Actors	Buyer, Seller
Pre-Conditions	
Process Steps	1. The Buyer submits a Retrieve Modify Product Order Item Delivery Date List request as shown in section 10.9 including filter criteria the Seller should apply. 2. The Seller receives the request and validates the request. 3. The Seller determines if any Modify Product Order Item Delivery Date match the filter criteria in the request. 4. The Seller returns a list of summarized Modify Product Order Item Delivery Date instances as specified in section 10.9.2
Post-Conditions	1. The Buyer has a list of all Modify Product Order Item 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 Delivery Date Identifier.
Alternative Paths	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: • 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 Delivery Date requests. 3. If the query does not find any matching records, then the Seller responds with an indication of this result.

Table 13 – Retrieve List of Modify Product Order Item Delivery Dates Use Case

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

8.2.2.3   *Retrieve Modify Product Order Item Delivery Date by Identifier*

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

Field	Description
Use Case #	7
Use Case Name	Retrieve Modify Product Order Item Delivery Date by Identifier
Description	A request initiated by the Buyer to retrieve the details of a Modify Product Order Item Delivery Date with the given Identifier. This includes all Modify Product Order Item Delivery Date attributes.
Actors	Buyer, Seller
Pre-Conditions	1. The Buyer knows the Modify Product Order Item Delivery Date Identifier they want to retrieve details on. 2. The Modify Product Order Item Delivery Date Identifier exists in the Seller's system and the Modify Product Order Item Date is available for online retrieval. Note: Any Modify Product Order Item Delivery Date submitted by the Buyer that exists in the Seller's system must be able to be retrieved via the API
Process Steps	1. The Buyer initiates a Retrieve Modify Product Order Delivery Date by Identifier request to the Seller using the Modify Product Order Item Delivery Date Identifier. 2. The Seller responds to the Retrieve Modify Product Order Item Delivery Date by Identifier request with the up-to-date view of the Modify Product Order Item Delivery Date as shown in section 10.10.2.
Post-Conditions	1. The Buyer has detailed information on the Modify Product Order Item Date with the given Modify Product Order Item Delivery Date Identifier.

Alternative Paths	1. If errors are encountered, the Seller returns all identified errors in a reject response and the Buyer may submit a new query. 2. If the Modify Product Order Item Date is not found, the Buyer must receive a response indicating this. 3. If the Buyer is not authorized to retrieve the Modify Product Order Item Date, the Buyer must receive a response indicating this. 4. If the Seller has archived a Modify Product Order Item Date after reaching a final state, the Seller may return an error because it is no longer possible to retrieve the Modify Product Order Item Date.

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

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

8.2.3   Cancel Product Order

The following Use Cases are contained in this section:

- Cancel Product Order Request

- Retrieve List of Cancel Product Orders

- Retrieve Cancel Product Order by Cancel Product Order Identifier

8.2.3.1   Cancel Product Order Use Case

The Cancel 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	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 can cancel the Product Order. Buyers may only cancel Product Orders that they initiated.
Process Steps		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. 6. The Seller notifies the Buyer of any charges resulting from cancelling the referenced Product Order while the Cancel Product Order is in the ACKNOWLEDGED state. (See Charge as described in section 8.2.4 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 COMPLETED and the referenced Product Order state is set to CANCELLING. 9. Once the Seller has completed the cancellation process, the state of the referenced Product Order is changed to CANCELLED.		
Post-Conditions		1. The Product Order is cancelled.		
Alternative Paths		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 Request 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 REJECTED, and the referenced Product Order state is set to IN_PROGRESS.		

Table 15 – Cancel Product Order Request Use Case

8.2.3.2 Retrieve Cancel Product Order List

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

Field	Description
Use Case #	9

Use Case Name	Retrieve List of Cancel 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	1. The Buyer submits a Retrieve List of Cancel Product Orders as shown in section 10.11.1 based on the filter criteria options. 2. The Seller receives the request and validates the request. 3. The Seller determines if there are any Cancel Product Orders that match the filter criteria in the request. 4. The Seller returns a list of summarized cancel instances as specified in section 10.11.2
Post-Conditions	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 Seller Cancel Request Identifier.
Alternative Paths	1. If errors are encountered, the Seller returns all identified errors in a reject response and the Buyer may submit a new query. 2. If the quantity of records exceeds a Seller's policy, the Seller must choose to respond with either: • an empty list and message that indicates the result set is too large and submit a new more specific query or • a response that indicates the result is too large and includes a subset of the matching Product Orders. 3. If the query does not find any matching records, then the Seller will respond with an indication of this result.

Table 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.

8.2.3.3 *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	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 Request by Cancel Identifier request with the up-to-date view of the Cancel Request as specified in 10.12.2.
Post-Conditions	1. The Buyer has detailed information on the specified Cancel Product Order Identifier.
Alternative Paths	1. If errors are encountered, the Seller returns all identified errors in a reject response and the Buyer may submit a new query. 2. If the Seller Cancel Request Identifier is not found, the Buyer must receive a reject response. 3. If the Seller has archived a Cancel Request after reaching a final state, the Seller may return an error since the Cancel Request is no longer able to be retrieved.

Table 17 – Retrieve Cancel Product Order Request by Cancel Request 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.

8.2.4   Charge

The following Use Cases are contained in this section:

- Initiate Charge

- Respond to Charge

- Retrieve List of Charges

- Retrieve Charge by Charge Identifier

8.2.4.1 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 Delivery Date, or Cancel Product Order. The Seller identifies one or more charges associated with the Product Order Item, Modify Product Order Item 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 may be included in the Charge.

8.2.4.1.1 Charge for Product Order Use Case

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

Field	Description
Use Case #	11-a
Use Case Name	Initiate Charge Associated to Product Order Item
Description	The sub-Use Case does not include Modify Product Order Item Delivery Date or Cancel Product Order charges
Process Steps	1. The Seller identifies one or more charges as specified in section 10.5.1 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 and if subscribed the Product Order Item State Change notification, queries the Product Order by Product Order Identifier, and receives any Charges associated with each Product Order Item contained within the Product Order.

Post-Conditions		1. Buyer is aware of Charge linked to one or more Product Order Items 2. Seller is awaiting Acceptance / Rejection of Identified Charge 3. Product Order is in state HELD and execution of the Product Order Item is stopped.
Alternative Paths		1. The Buyer or Seller returns an error message if an error is encountered while processing that prevents the Buyer or Seller from completing the request. 2. If the Seller identifies additional charges for a Product Order Item, they may withdraw the Charge that is in the AWAITING_RESPONSE state and notify the Buyer of the Charge state change. A new Charge is initiated by the Seller including the updated charges. The Seller may not withdraw a Charge that is not in the AWAITING_RESPONSE state.

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

8.2.4.1.2   Charge for Modify Product Order Item Delivery Date Use Case

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

Field	Description
Use Case #	11-b
Use Case Name	Initiate Charge Associated to Modify Product Order Item Delivery Date (Expedite Indicator and Requested Completion Date)
Description	This sub-Use Case does not include Product Order or Cancel Order charges
Process Steps	1. The Seller identifies one or more charges as specified in section 10.5.1 associated with a Modify Product Order Item 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 Delivery Date moves to the ASSESSING_CHARGE state until a response is received from the Buyer or the request for information expires, and a Modify Product Order Item Delivery Date State Change notification is sent by the Seller. 2. The Buyer receives the CHARGE_CREATE notification, a Modify Product Order Item Delivery Date State Change notification if subscribed or queries the Modify Product Order Item Delivery Date by Modify Product Order Item Delivery Date Identifier and receives any Charges associated with Modify Product Order Item Delivery Date.
Post-Conditions	1. The Buyer has the charges identified by the Seller.

Alternative Paths		1. The Buyer or Seller returns an error message if an error is encountered while processing that prevents the Buyer or Seller from completing the request. 2. If the Seller identifies additional charges for a Modify Product Order Item Delivery Date, they withdraw the Charge and notify the Buyer of the Charge state change. A new Charge is initiated by the Seller including the updated charges.

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

8.2.4.1.3   Charge for 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 or Modify Product Order Item Delivery Date charges	
Process Steps		1. The Seller identifies one or more charges as specified in section 10.5.1 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. 2. 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		1. The Buyer has the charges identified by the Seller.
Alternative Paths		1. The Buyer or Seller returns an error message if an error is encountered while processing that prevents the Buyer or Seller from completing the request. 2. If the Seller identifies additional charges for a Cancel Product Order, they withdraw the Charge and notify the Buyer of the Charge state change. A new Charge is initiated by the Seller including the updated charges.

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

8.2.4.2 *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	1. The Buyer and Seller have agreed to the charges that will be accepted, that will be declined, and the Product Order state can be updated 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

8.2.4.2.1 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	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 response. 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 and changes the referenced Product Order Item state to IN_PROGRESS.

Alternative Paths		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 Identifier 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. 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. 4. If the Buyer rejects 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.

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

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

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

Field	Description
Use Case #	12-b
Use Case Name	Respond to Charge Associated to a Modify Product Order Item Delivery Date
Process Steps	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 the charges, the Seller changes the state of the Charge to COMPLETED and changes the referenced Modify Product Order Item Delivery Date state to COMPLETED.

		3. The Seller updates the Product Order Item referenced in the Modify Product Order Item Delivery Date with the charges and with the appropriate date changes.
Alternative Paths		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 charges associated to a Modify Product Order Item Delivery Date are Blocking charges) within a Charge Identifier, the Seller changes the state of the Charge to COMPLETED, changes the referenced Modify Product Order Item Delivery Date state to DECLINED. No modification to the Product Order Item is performed.
		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.

Table 24 – Respond to Charge Associated to Modify Product Order Item Delivery Date Use Case

8.2.4.2.3   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	1. The Buyer responds to the Charge with either an ACCEPTED or REJECTED for each and every Charge Item included in the Charge.
	2. If the Buyer accepts the charges, the Seller changes the state of the Charge to 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	1. The Seller returns an error message if an error is encountered while processing that prevents the Buyer or Seller from completing the request.

		2. If the Buyer rejects a Charge Identifier that is identified as a Blocking charge (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 is not cancelled. 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.

Table 25 – Respond to Charge Associated to Cancel Product Order Use Case Retrieve List of Charges Use Case

8.2.4.3 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	1. The Buyer submits a Retrieve List of Charges request as shown in section 10.13.1 based on the filter criteria options. 2. The Seller receives the request and validates the request. 3. The Seller determines if there are any Charges that match the filter criteria in the request. 4. The Seller returns a list of summarized Charge instances as specified in section 10.13.2.
Post-Conditions	1. The Buyer receives the appropriate response. 2. The Buyer may initiate Use Case 14 to obtain detailed information on a Charge Identifier.

Alternative Paths	1. If errors are encountered, the Seller returns all identified errors in a reject response and the Buyer may submit a new query. 2. If the quantity of records exceeds a Seller's policy, the Seller must choose to respond with either: • an empty list and message that indicates the result set is too large and submit a new more specific query or • a response that indicates the result is too large and includes a subset of the matching Charges. 3. If the query does not find any matching records, then the Seller will respond with an indication of this result.

Table 26 – Retrieve List of Charges Use Case

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

8.2.4.4   *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 a Charge-by-Charge Identifier
Actors	Buyer, Seller
Pre-Conditions	
Process Steps	1. The Buyer initiates a Retrieve Charge by Charge Identifier request to the Seller using the Seller Charge Identifier. 2. The Seller responds to the Query Charge Identifier with the latest view of the Charge as shown in 10.14.2.
Post-Conditions	1. The Buyer has detailed information on the specified Seller Charge Identifier.

Alternative Paths		1. If errors are encountered, the Seller returns all identified errors in a reject response and the Buyer may submit a new query. 2. If the Seller Charge Identifier is not found, the Buyer must receive a reject response.

Table 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.

8.2.5 Notification Use Cases

The following Use Cases are contained in this section:

- Register for Notifications

- Send Notification

8.2.5.1 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	1. The Seller supports notifications.
Process Steps	1. The Buyer sends the Register for Notifications request as shown in section 10.15.1 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, where to send such notifications for this Buyer. 4. The Seller returns an acknowledgement to the Buyer as shown in section 10.15.2

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 9 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 is mandatory. Subscription to the CHARGE_CREATE notification by the Buyer is mandatory.

8.2.5.2   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	1. The Seller supports notifications. 2. The Buyer has subscribed to Notifications.
Process Steps	1. The Seller sends the notifications to the location(s) registered by the Buyer as shown in section 10.16.
Post-Conditions	1. The Seller has sent related notification.
Alternative Paths	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 notifications that are supported for the Use Cases in this document. An X indicates that the notification is supported for that Use Case. A blank indicates that notifications are not supported for that Use Case.

Use Case	State Change	Milestone
1	X	X
1-a	X	X
1-b	X	X
1-c	X	X
2		
3		
4		
5	X	
5-a	X	
5-b	X	
6		
7		
8	X	
9		
10		
11	X	
11-a	X	
11-b	X	
11-c	X	
12	X	
12-a	X	
12-b	X	
12-c	X	
13		
14		
15		
16		

Table 30 – Use Case to Notification Type Matrix

8.3 Seller and Buyer Interaction for Charges

Within the Product Order process (Create Product Order, Modify Product Order Item 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 to the Seller to communicate on changes in the cost by the Seller. The different sub-processes supported are described in the subsequent sub-sections.

8.3.1 Charge

When new non-recurring or changes on recurring 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 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 reject 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 Item associated with the Charge in a HELD state and awaits a response from the Buyer. If the Buyer rejects a Blocking Charge, the Seller will cancel that Product Order Item and any related Product Order Items. If the Buyer rejects a non-Blocking Charge Item, the Seller may proceed with fulfillment of the Product Order Item.
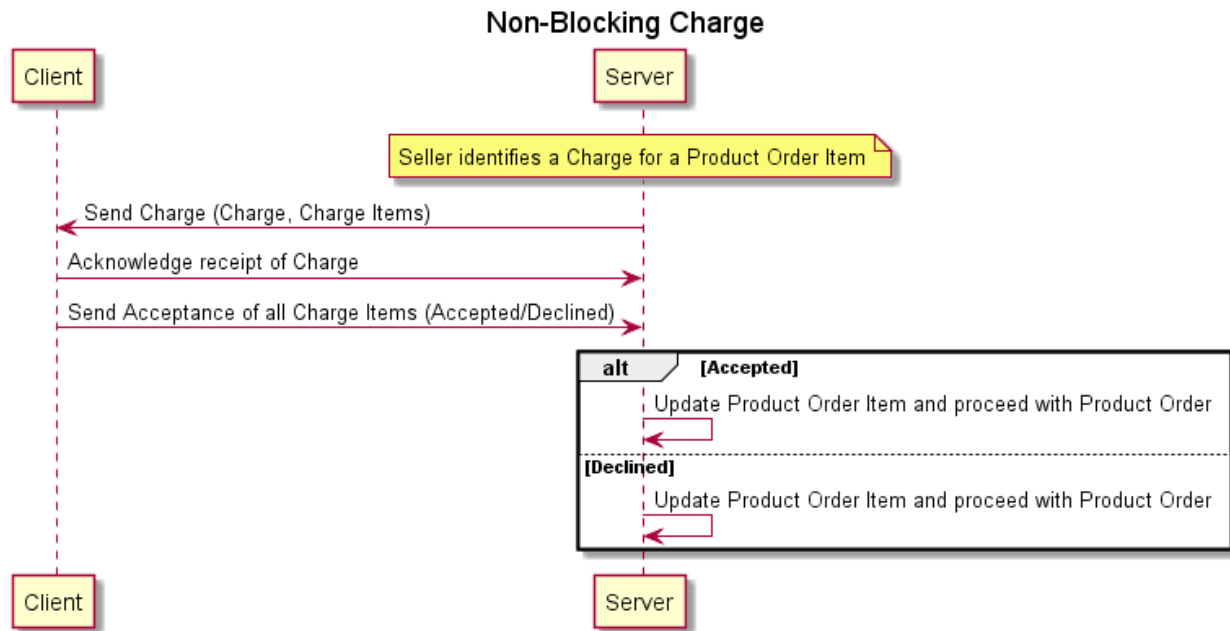
Figure 3 – Non-Blocking Charge Sequence
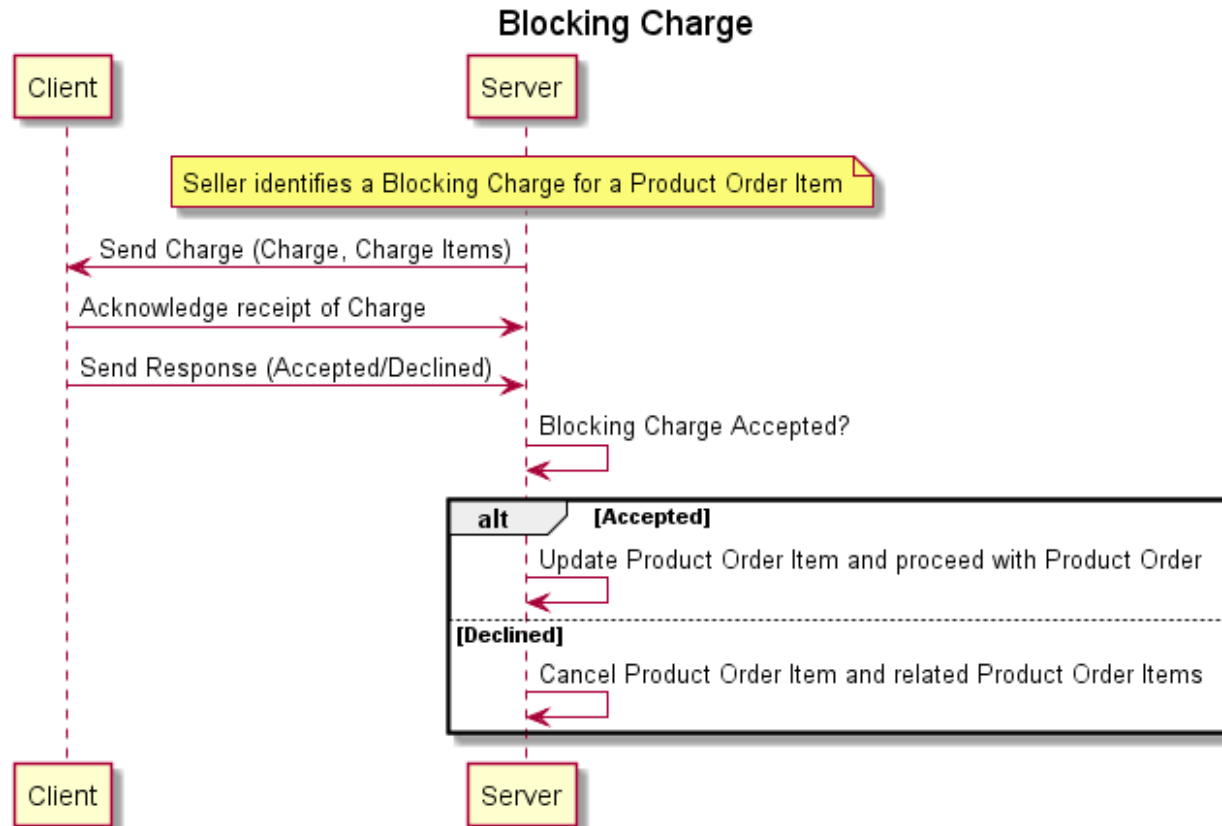
Figure 4 – Blocking Charge Sequence Diagram

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 or non-recurring Charge Items related to the same Product Order Item (charges associated with a Cancel Product Order are assigned to the first Product Order Item in the Product Order)

- A Product Order Item cannot have more than one Charge active at the same time

- A Charge must be related to exactly one Product Order Item

- A Charge may be initiated for a Product Order in the following Product Order states: IN-PROGRESS, ASSESSING_CANCELLATION, ASSESSING_CHARGE, or 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.

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

The Seller determines if they will accept the expedite and what the extra costs are to expedite the Product Order Item. If the Seller is willing to accept the expedite request, they include any Charge Items in a Charge and notify the Buyer that a Charge has been created. The Seller adds the costs associated with expediting the Product Order Item in the Product Order Item Related Charges attribute. The Charge and 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 HELD 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. 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.

8.3.3 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 using the Product Order Item Charges attributes, specifying that the Charge Type is Construction and the Charge Value. Normally, Construction Charges are considered Blocking Charges by the Seller.

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

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

If the Buyer accepts the Charge Item(s) associated with the construction charges, the Seller proceeds with the Product Order. If the Buyer declines the Charge Item(s) associated with the construction charges and the Seller indicated that these are blocking charges, the Seller cancels 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.

8.3.4 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 using the Charge specifying that the Charge Type is Connection and the Charge Value.

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

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

If the Buyer accepts the Charge Item(s) associated with the connection charges, the seller proceeds with the Product Order. If the Buyer declines the Charge Item(s) associated with the connection charges and the seller indicated that these are blocking charges, the Seller cancels the Product Order Item and any related Product Order Items.

9 Product Order Operation Attributes

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

The columns in the tables are as follows:

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

Comments   Comments about the attribute

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

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

9.1 Buyer and Seller Attributes

Table 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 10.17 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 10.17 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

[R2]   The Seller Response Code **MUST** be included in all Seller responses.

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9.2   Product Order Attributes

The attributes associated with the Create New Product Order Request (Use Case 1), Create Change Product Order Request (Use Case 2), Create Disconnect Product Order Request (Use Case 3), and Cancel In-Flight Product Order Request (Use Case 7) for a Product Order are shown in Table 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
Product Order Version	The version of the Product Order	String	Set by the Seller.
Buyer Product Order Identifier	An identifier for this Product Order within the Buyer's enterprise.	Identifier	Assigned by Buyer. Retained by Seller
Product Order Create Date	Date when the Product Order was created in the Seller's system 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	An optional free-form text field for the Seller to provide additional information regarding the reason for the cancellation.	String	Set by the Seller. If the Seller cancels the Product Order, the Seller provides the reason. If the Buyer requests the cancellation, the Seller copies the reason provided by the Buyer from the Cancel Request.
Cancel Product Order Charge	Charges associated with cancelling the Product Order	List of references to Charges (Table 47)	Set by the Seller.

Attribute	Description	Type	Comments
Note	Free form text to clarify or explain the Product Order	List of Note (Table 46)	
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 [10] 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 • 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.
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)	

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

9.2.1 Updatable Product Order Attributes

The Product Order Attributes that can be updated as described in the Update Product Order Use Case are defined in Table 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 46)	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.

9.3   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 • 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 45)	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	List of Product Order Item	

Attribute	Description	Type	Comments
	Order Items in the Product Order	Relationships (Table 40)	
Product Order Item Coordinated Action	The interval after the completion of one or more related Product Order Items that this Product Order Item can be started or completed.	List of Product Order Item Coordinated Action (Table 41)	
Product Relationship	The relationship between a Product Order Item and one or more existing Products.	List of Product Relationship (Table 42)	
Product Order Item Note	A set of notes associated to the Product Order Item. This can be empty.	List of Note (Table 46)	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.

Attribute	Description	Type	Comments
Product Order Item Expedite Indicator	Indicates that expedited treatment is requested.	Boolean	Set by the Buyer. Default Value = FALSE. If this is set to TRUE, the Buyer sets the Requested Completion Date to the expedited date. See section 8.3 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 8.3 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 expedite the Product Order in the Related Charges attribute.
Related Charges	The Charges associated to this Product Order Item	List of references to Charges (see Table 47)	This list contains all Charges initiated by the Seller. See section 8.3 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
Buyer Product Order Item Contact	Identifies the name of the person or office that is buying the product.	List of Contacts (Table 38)	

Attribute	Description	Type	Comments
Buyer Implementation Contact	Identifies the name of the person or office that is the implementation contact for the Product Order Item.	List of Contacts (Table 38)	
Buyer Technical Contact	Identifies the name of the person or office that is the technical contact for the Product Order Item.	List of Contacts (Table 38)	
Buyer Fault Contact	Identifies the name of the person or office that is the fault contact for the Product Order Item.	List of Contacts (Table 38)	
Seller Fault Contact	Identifies the name of the person or office that is the fault contact for the Product Order Item.	List of Contacts (Table 38)	
Buyer GDPR Contact	Identifies the name of the person or office that is the GDPR contact for the Product Order Item.	List of Contacts (Table 38)	
Seller GDPR Contact	Identifies the name of the person or office that is the GDPR contact for the Product Order Item.	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	Identifies the date the Seller completed the Product Order Item.	dateTime	Set by the Seller when Product Order

Attribute	Description	Type	Comments
Completion Date			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 51)	Set by the Buyer. The POQ attributes may be required by the Seller. In that case, this is a 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 • ACKNOWL EDGED • CANCELLE D • COMPLETE D • FAILED • HELD • IN_PROGRE SS • PENDING • REJECTED • UNASSESSE D • VALIDATE D	Set by the Seller.
Product Order Item Quote Item	The Quote and Quote Item associated to this Product Order Item.	Quote Item Reference Attributes (Table 52)	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 50)	Set by the Buyer
Product Order Item Term	Term of the Product Order Item	Term (Table 50)	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.	String	Set by the Buyer and retained by the Seller.
Buyer Billing Information	Buyer billing information	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.
Product Order Item Termination Error	When the Seller cannot process the Product Order Item Request, the Seller returns a text-based list of reasons here.	List of String	Set by the Seller. Reasons are for further study.

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.

9.3.1 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 46)	Only new notes can be entered. The Buyer cannot modify an existing Product Order Item Note.
Buyer Product Order Item Contact	Identifies the name of the person or office that is buying the product.	Contact (Table 38)	

Attribute	Description	Type	Comments
Buyer Implementation Contact	Identifies the name of the person or office that is the implementation contact for the Product Order Item.	Contact (Table 38)	
Buyer Technical Contact	Identifies the name of the person or office that is the technical contact for the Product Order Item.	Contact (Table 38)	
Buyer Fault Contact	Identifies the name of the person or office that is the fault contact for the Product Order Item.	List of Contacts (Table 38)	
Buyer GDPR Contact	Identifies the name of the person or office that is the GDPR contact for the Product Order Item.	List of Contacts (Table 38)	
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

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.

9.4   Modify Product Order Item Delivery Date Request Attributes

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

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

Attribute	Description	Type	Comments
Modify Product Order Item Delivery Date State	The state of the Modify Product Order Item Delivery Date	One of: • ACKNOWLEDGED • ASSESSING_CHARGE • COMPLETED • DECLINED • REJECTED •	Set by the Seller

Table 36 – Modify Product Order Item Date Attributes

9.5 Cancel Product Order Request Attributes

The Cancel Product Order Request attributes are detailed in Table 37.

Attribute	Description	Type	Comments
Seller Cancel Product Order Identifier	Unique identifier for the Cancel Product Order that is generated by the Seller when the Cancel Product Order request is acknowledged via an API	Identifier	Provided by the Seller
Product Order Identifier	Unique identifier for the Product Order that is generated by the Seller when the Product Order is initially accepted via an API.	Identifier	Value is set by the Buyer using Seller specified Product Order Identifier that is to be cancelled.
Product Order Version	The version of the Product Order	String	Value is set by the Buyer using Seller specified Product Order Version of the Product Order that is to be cancelled.

Attribute	Description	Type	Comments
Cancel Product Order State	The states as defined by TMF622 [10] and extended to meet MEF requirements. These states are used to convey the Cancel Product Order status during the lifecycle of the Product Order.	One of the following • ACKNOWLE DGED • ASSESSING_ CHARGE • COMPLETED • DECLINED • REJECTED	Set by the Seller
Cancel Product Order Contact	Identifies the name of the person or office that is responsible for the Cancel Request within the Buyer's organization.	List Reference to Contact (Table 38)	Set by Buyer
Seller Contact	Identifies the name of the person or office that is selling the product.	List Reference to Contact (Table 38)	Set by Seller
Cancellation Reason Type	Identifies the type of reason, Technical or Commercial, for the Cancellation Request	One of : • TECHNICAL • COMMERCIA L	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 is denied by the Seller, the Seller provides a reason to the Buyer using this attribute.	String	Set by the Seller

Table 37 – Cancel Product Order Attributes

9.6   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 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.	Postal address that includes all attributes of the Fielded Address (see MEF 79 [7] section 8.9.2)	
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.

> **[R3]** 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

9.7 Buyer Billing Attributes

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

Attribute	Description	Type	Comments
Billing Account	Identifies the billing account to which the recurring and non-recurring charges for this request will be billed.	String	Required if the Buyer has more than one Billing Account with the Seller and for all new Product Orders.
Billing Contact	The Buyer contact for Billing.	Contact (Table 38)	

Table 39 – Buyer Billing Attributes

9.8 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.

9.9 Product Order Item Coordinated Action

Table 41 shows Coordinated Action attributes.

Attribute	Description	Type	Comments
Product Order Item Reference Identifier	Specifies one or more Product Order Items that are to be	Product Order Item Reference Identifiers	Set by the Buyer

	coordinated with this Product Order Item.		
Product Order Item Coordination Dependency	A dependency between the Product Order Item and a related Product Order Item	One of: • 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 related, are used below to describe the Coordination Dependency below. For purposes of this table, these are defined as:

- Specified – the Product Order Item with a Coordinated Dependency

- Related – 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 of each of these is provided.

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

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

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

FINISH_TO_FINISH – Work on the related Product Order Items completes at the same time as the specified Product Order Item.

9.10 Product Relationship Attributes

Table 42 shows Product Relationship attributes.

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

Table 42 – 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 42 are repeated for each Product Identifier that has a relationship with the Product Order Item.

9.11 Notification Registration Attributes

Table 43 shows the Notification Registration attributes.

Attribute	Description	Type
Return Address Information	The detailed information on the mechanism and address specifying where the Seller is to send any Product Order Notifications. There can be multiple locations for one Buyer.	String
List of Notification Types	The types of notifications that the Buyer wishes to receive.	List of one or more of: • CANCEL_STATE_CHANGE • CHARGE_CREATE • CHARGE_STATE_CHANGE • CHARGE_TIMEOUT • MODIFY_PRODUCT_ORDER_ITEM_DELIVERY_DATE_STATE_CHA • PRODUCT_ORDER_EXPECTED_COMPLETION_DATE_SET • PRODUCT ORDER_ITEM_EXPECTED_COMPLETION_DATE_SET • PRODUCT_ORDER_STATE_CHANGE • PRODUCT ORDER_ITEM_STATE CHANGE • PRODUCT_SPECIFIC_PRODUCT_ORDER_ITEM_MILESTONE
Action	Specification to Start Notifications or Stop Notifications.	One of: • START • STOP

Table 43 – Register for Notifications Buyer Attributes

[R4] The Buyer **MUST** register for Charge related notifications if the Seller supports charges across the API.

9.12 Notification Attributes

Table 44 shows Notification attributes.

Attribute	Description	Type	Comments
Seller Object Identifier	Unique identifier that is generated by the Seller when the Seller Object Identifier Type is initially accepted or created via an API.	Identifier	Set by the Seller
Item Reference Identifier	A Buyer provided identifier to identify an Item and to be able to relate Items to one another.	Identifier	Provided by Seller. This is set by the Buyer and is unique within the Product Order.
Seller Object Identifier Type	The type of Seller Object Identifier.	One of: • PRODUCT ORDER • CANCEL_PRODUCT_ORDER • CHARGE • MODIFY_PRODUCT_ORDER_ITEM_DELIVERY_DATE__	Set by the Seller

Notification Types	The type of notifications	One of • CANCEL_STATE_CHAN GE • CHARGE_CREATE • CHARGE_STATE_CHAN GE • MODIFY_PRODUCT_OR DER_ITEM_ _DATE_STATE_CHANG E • PRODUCT_ORDER_ITE M_EXPECTED_COMPLE TION_DATE_SET • PRODUCT ORDER_STATE_CHANG E • PRODUCT_ORDER_ITE M_STATE CHANGE • PRODUCT_SPECIFIC_P RODUCT_ORDER_ITEM _MILESTONE	includes MILESTONE_ NAME attribute

Table 44 – Seller Notification Attributes

[R5]　　The Seller **MUST** support the CHARGE_CREATE notification if the Seller supports Charges on the API.

[O3]　　The Seller **MAY** support the CHARGE_STATE_CHANGE notification if the Seller supports Charges on the API.

9.13 Place Relationship Attributes

Table 45 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: • SERVICE_ SITE • FIELDED_ ADDRESS	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

		• FORMATT ED_ADDR ESS • GEOGRAP HIC_POIN T • GEOGRAP HIC_ADD RESS_LAB EL	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: • 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 45 – Place Relationship Attributes

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

9.14 Note Attributes

Table 46 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: • BUYER • SELLER	Set by the Buyer or Seller
Note Text	The text of the note.	String	

Table 46 – Note Attributes

9.15 Charge Attributes

Table 47 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 charges to the Buyer.	Identifier	Provided by the Seller
Product Order Item Reference Number	The Product Order Item Reference Number for the Product Order Item that the Charge is related to.	String	Provided by the Seller and matches the Product Order Item Reference Number in the Product Order Request
Replaced Charge Identifier	The Charge Identifier of the last Charge that had at least one accepted Charge Item when at least one of the Charge Items is being replaced due to changes to the Charge Item.	String	This is used when Charge is replacing a Charge where one or more Charge Items have been accepted by the Buyer.
Charge Items	A list of Charge Items contained in the Charge	List of Charge Items (Table 48)	Set by the Seller

Attribute	Description	Type	Comments
Response Due Date	The date that the Buyer must respond to the Seller's Charge If there is no response received by the Response Due Date the Seller will set all Charge Items that have not reached a final state in status DECLINED_BY_BUYER and put the Charge in status COMPLETED.	dateTime	Set by the Seller
Charge State	The state of the Charge	One of the following: • AWAITING_RESPONSE • COMPLETED • WITHDRAWN_BY_SELLER	State is set by the Seller

Table 47 – Charge Attributes

9.16 Charge Item Attributes

Table 48 shows the Charge Item attributes.

Attribute	Description	Type	Comments
Charge Item Identifier	An identifier that is unique among all Charge Items within a Charge associated to a Product Order Item	Identifier	Set by the Seller
Charge Item Type	The type of charge.	One of the following: • RECURRING • NON_RECURRING • USAGE_BASED	Set by the Seller.
Charge Item Description	A description of the charge	One of: • EXPEDITE • CONSTRUCTION • CONNECTION • CANCELLATION • DISCONNECT	Set by Seller
Charge Item Activity Type	Indicates if this is a new charge or a change to a charge provided in a Quote.	One of: • NEW • CHANGE	Set by the Seller
Recurring Charge Item Period	Used for a Charge with a Charge Type = RECURRING to indicate the period	One of • HOUR • DAY • WEEK • MONTH • YEAR	Set by the Seller
Charge Item Price Unit Of Measure	Unit of Measure (Gb, SMS volume, etc.) if Charge Item Charge Type = USAGE_BASED	String	Set by the Seller if Charge Item Charge Type = USAGE_BASED

Attribute	Description	Type	Comments
Blocking	Indicates if rejecting the charge will cause the Seller to cancel the Product Order Item or close the Cancel Product Order or Modify Product Order Item Delivery Date without action.	Boolean	Set by the Seller
Charge Item Price	The value associated with the charge	Price (Table 49)	Set by the Seller
Charge Item Acceptance Indicator	Indicates if the Buyer has accepted the specified charge	One of the following: • ACCEPTED • DECLINED	Set by the Buyer.
Charge Item State	The state of the Charge Item	• AWAITING_RESPONSE • ACCEPTED_BY_BUYER • DECLINED_BY_BUYER • WITHDRAWN_BY_SELLER	

Table 48 – Charge Item Attributes

9.17 Price Attributes

Table 49 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 • Currency • Value	This is an optional attribute set by the Seller
Price Duty Free Amount	All taxes excluded amount (expressed in the given currency).	Money • Currency • Value	

Table 49 – Price Attributes

9.18 Term Attributes

Table 50 shows the Term attributes.

Attribute	Description	Type	Comments
Product Order Item Term Duration	Duration of the term	Duration	Set by the Buyer. If not set by the Buyer, this is set by the Seller.
Seller End of Term Action	The action the Seller will take once the term expires. Applicable actions are defined in Product Offering.	Indicator with following allowed values: • ROLL • AUTO_DISCONNECT • AUTO_RENEW	Set by the Buyer. If not set by the Buyer, then this is set by the Seller. Roll indicates that the Product's contract will continue on a rolling basis for the duration of the Roll Interval at the end of the Term. Auto-disconnect indicates that the Product will be disconnected at the end of the Term. Auto-renew indicates that the Product's contract will be automatically renewed for the Term Duration at the end of the Term.
Roll Interval	The recurring period that the Buyer must pay to the end of upon disconnecting the Product after the original term has expired.	Duration	Set by Seller if Seller End of Term Action is Roll

Table 50 – Term Attributes

9.19 POQ Item Reference Attributes

Table 51 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]. Seller can make this field mandatory or optional.
Alternate Product Proposal Identifier	A unique identifier for this Alternate Product Proposal assigned by the Seller.	String	If the Buyer has performed a POQ and desires to select one and only one of the Alternate Product Proposals per Quote Item they identify the alternate proposal using the Alternate Product Proposal Identifier from the POQ response as specified in MEF 79 [7].

Table 51 – POQ Item Reference Attributes

9.20 Quote Item Reference Attributes

Table 52 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.
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 52 – Quote Item Reference Attributes

9.21 Duration

Table 53 shows the attributes for Duration.

Attribute	Description	Type	Comments
Duration Unit	The unit of the duration.	String one of the following: • BUSINESS_DAYS • BUSINESS_HOURS • BUSINESS_MINUTES • CALENDER_MONTHS • CALENDAR_DAYS • CALENDAR_HOURS • CALENDAR_MINUTES	
Duration Value	The value of the duration.	Integer	

Table 53 – Duration Attributes

10 Product Order Requirements

This section contains the requirements for Product Orders for both Buyers and Sellers. Requirements for Sellers are divided into attributes that must be included in the Seller's initial

response to the Buyer's Create Product Order request and requirements that apply to updates during the lifecycle of the Product Order that are performed by the Seller.

10.1 Create Product Order

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

10.1.1 Buyer Create Product Order Request Product Order Level Attributes

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

[R6] 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 10.1.4 for detail on Product Order Item requirements)

[O4] The Buyer's Create Product Order request **MAY** contain any attributes identified in Table 32 as settable by the Buyer and not included in [R6].

[R7] The Buyer's Create Product Order request **MUST NOT** contain any attributes identified in Table 24 as settable by the Seller.

[O5] The Seller **MAY** require that the Buyer perform a POQ prior to submitting the Product Order.

[CR5]<[O5] The Buyer's Create Product Order request **MUST** contain the POQ Identifier if required by the Seller.

[O6] The Seller **MAY** require that the Buyer perform a Quote prior to submitting the Product Order.

[CR6]<[O6] The Buyer's Create Product Order request **MUST** contain the Quote Identifier if required by the Seller.

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

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

[R8] 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 Version

- Product Order State

- Seller Contact

[R9] The Seller Product Order Identifier **MUST** remain the same value for the life of the Product Order.

[R10] When providing a Response if the Seller Response Code does not indicate success, the Seller **MUST NOT** specify the Seller Product Order Identifier attribute in the response.

[R11] 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 [R6] and [O4].

[R12] The Seller **MUST** set the Seller Product Order Version to 1 (one) at the time that the Buyer Create Product Order is ACKNOWLEDGED.

10.1.3 Seller Product Order Lifecycle Updates Product Order Level

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

[R13] 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.

[O7] For all Product Order States other than FAILED and CANCELLED the Seller **MAY** include the Product Order Expected Completion Date.

[R14] 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.

[O8] The Seller **MAY** add a Note to any Product Order.

10.1.4 Buyer Create Product Order Product Order Item Common Requirements

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

[R15] The Buyer's Create Product Order request **MUST** contain the Buyer Product Order Item Contact, the Buyer Implementation Contact, and the Buyer Technical Contact as specified in Table 34.

[R16] The Buyer's Create Product Order request **MUST** contain the following attributes as specified in Table 25:

- Product Order Item Reference Number

- Product Order Item Product Action

- Product Order Item Requested Completion Date

[O9] The Seller **MAY** require that the Buyer Billing Attributes be the same for all Product Order Items in a Product Order.

[O10] 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

[R17] 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.

[R18] 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.

[O11] If the Product Order Item Product Action is CHANGE or DISCONNECT, the Buyer's Create Product Order request **MAY** contain the Buyer Billing Information as specified in Table 34.

[R19] If the Product Order Item Location Type as defined in Table 45 is SERVICE_SITE_IDENTIFIER, the Buyer's Create Product Order request **MUST** contain a Service Site Identifier as defined in Table 45.

[R20] If the Product Order Item Location Type as defined in Table 45 is FIELDED_ADDRESS, the Buyer's Create Product Order request **MUST** contain the Fielded Address attributes defined in Table 45.

[R21] If the Product Order Item Location Type as defined in Table 45 is FORMATTED_ADDRESS, the Buyer's Create Product Order request **MUST** contain the Formatted Address attributes defined in Table 45.

[R22] If the Product Order Item Location Type as defined in Table 45 is GLOBAL_ADDRESS, the Buyer's Create Product Order Request **MUST** contain the Global Address attributes defined in Table 45.

[R23] If the Product Order Item Location Type as defined in Table 45 is GEOGRAPHIC_POINTS, the Buyer's Create Product Order request **MUST** contain the Geographic Points attributes defined in Table 45.

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

[R24] The Seller's response to the Buyer's Create Product Order request **MUST** contain the Product Order Item State as defined in Table 34.

[R25] 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.

[R26] If the Buyer's Create Product Order request Product Order Item Expedite Indicator is FALSE, the Seller's response **MUST NOT** have the Product Order Item Expedite Accepted attribute set to TRUE.

[R27] The Seller's response **MUST NOT** include the Product Order Item Expedite Accepted attribute set to TRUE until the Charge for any charges associated with the expedite is complete.

10.1.6 Seller Lifecycle Response Product Order Item Common Requirements

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

[R28] If there are any additional non-recurring costs associated with the Product Order Item and the Product Order State is HELD, the Seller's response **MUST** have the Related Charges attribute filled with these non-recurring costs.

[R29] 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.

[R30]   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.

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

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

[R31]   The Buyer **MUST** provide the Requested Product Order Item Term.

[R32]   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.

[R33]   The Buyer's Create Product Order request **MUST** contain a Product Order Item Product Offering Identifier.

[R34]   The Buyer **MUST** include the Buyer Billing Account as specified in Table 25 and Table 39. even if the presumed price is zero.

[R35]   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.

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

This section defines the attributes and requirements for the Seller's Response to a Buyer's Create Product Order request when the Product Order Item Product Action is INSTALL. These requirements are covered as Common requirements in section 10.1.6 .

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

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

[R36]   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.

[R37]   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.

[R38]   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.

[R39]   If the Product Order Item State in the Seller's response is CANCELLED, the Product Order Item Expected Completion Date attribute **MUST NOT** be provided.

[O12]   For all Product Order Item States other than IN_PROGRESS, FAILED, and CANCELLED the Seller **MAY** include the Product Order Item Expected Completion Date.

[R40]   If the Product Order Item State in the Seller's response is COMPLETED, the response **MUST** contain the Product Order Item Completion Date attribute as defined in Table 34.

[R41]   If the Product Order Item State in the Seller's response is not COMPLETED, the response **MUST NOT** contain the Product Order Item Completion Date attribute.

[R42]   If the Seller revises the Expected Completion Date for any Product Order Item, they **MUST** include a Product Order Item Note that indicates that the date has been revised and the reason for the revision.

10.1.10 Buyer Create Product Order Product Order Item Product Action CHANGE

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

[R43]   The Buyer **MUST** provide the Requested Product Order Item Term if required by the Seller for the requested change.

[R44]   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.

[R45]   If the Product Order Item Product Action is CHANGE, the Buyer's Create Product Order request **MUST** contain a Product Order Item Product Identifier for an existing product.

[O13]   If the Product Order Item Product Action is CHANGE, the Buyer **MAY** include the Buyer Billing Account as specified in Table 25 and Table 39.

[O14]   The Seller **MAY** require that the Buyer Billing Attributes be the same for all Product Order Items in a Product Order.

10.1.11 Seller 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.

[R46]   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.

10.1.12 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.

[R47]   The Buyer's Create Product Order request **MUST** contain a Product Order Item Product Identifier for the existing product to be disconnected.

[O15]   The Buyer **MAY** include the Buyer Billing Account as specified in Table 25 and Table 39.

[R48]   The Buyer **MUST NOT** provide any attributes not specified in [R47] and [O15].

10.1.13 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.

[R49]   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.

[R50]   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.

[O16]   For all Product Order Item States not described in FAILED and CANCELLED the Seller **MAY** include the Product Order Item Expected Completion Date.

[R51]   If the Product Order Item State in the Seller's response is not COMPLETED, the response **MUST NOT** contain the Product Order Item Completion Date attribute.

10.2 Update Product Order Attributes

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

10.2.1 Buyer Update Product Order Attributes Request

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

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

[R52]   A Buyer's Update Product Order Attributes request **MUST** contain the following attributes:

- Product Order Identifier

- Product Order Version

[R53]   A Buyer's Update Product Order Attributes request **MUST** contain one or more of the updateable attributes shown in Table 33.

[R54]   A Buyer's Update Product Order Attributes request **MUST NOT** contain attributes not included in [R52] and [R53].

10.2.2 Seller Update Product Order Attributes Response

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

[R55]   The Seller **MUST** indicate if the Update Product Order Attributes request was successful or not using the Seller Response Code.

[R56]   If successful, the Seller **MUST** update the Product Order Attribute(s) as requested by the Buyer.

[R57]   If not successful, the Seller **MUST NOT** update the Product Order Attribute(s) as requested by the Buyer.

10.3 Update Product Order Item Attributes

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

10.3.1 Buyer Update Product Order Item Attributes Request

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

A Buyer is limited to updating the Product Order Item Attributes shown in Table 35.

[R58]   A Buyer's Update Product Order Item Attributes request **MUST** contain the following attributes:

- Product Order Identifier

- Product Order Version

- Product Order Item Reference Identifier

[R59]   A Buyer's Update Product Order Item Attributes request **MUST** contain one or more of the updateable attributes shown in Table 35.

[R60] A Buyer's Update Product Order Attributes request **MUST NOT** contain attributes not included in [R58] and [R59].

10.3.2 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.

[R61] The Seller **MUST** indicate if the Update Product Order Item Attributes request was successful or not using the Seller Response Code.

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

10.4 Modify Product Order Item Delivery Date

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

[R62] The Seller **MUST** increment the Seller Product Order Version by 1 (one) each time a Modify Request is accepted for this Product Order.

10.4.1 Expedite Product Order Item

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

10.4.1.1 Buyer Create Modify Product Order Item Delivery Date Request

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

[R63] The Buyer's Create Modify Product Order Item Delivery Date request **MUST** contain the following attributes as specified in Table 36:

- Product Order Identifier

- Product Order Version

- Product Order Item Reference Identifier

- Product Order Item Expedite Indicator

[O17] The Buyer's Create Modify Product Order Item Delivery Date request **MAY** contain the Product Order Item Requested Delivery Date as specified in Table 36.

10.4.1.2 Seller Create Modify Product Order Item Response

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

[R64] When providing a response 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 Delivery Date Identifier

- Modify Product Order Item Delivery Date State

[R65] The Seller response **MUST** echo back all attributes and values in the Buyer's request.

[R66] The Seller Modify Product Order Item Delivery Date Identifier **MUST** remain the same value for the life of the Modify Product Order Item Delivery Date request.

10.4.2 Modify Product Order Item Requested Delivery Date

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

10.4.2.1 Buyer Create Modify Product Order Item Delivery Date Request

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

[R67] The Buyer's Create Modify Product Order Item 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

10.4.2.2 Seller Create Modify Product Order Item Delivery Date Response

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

[R68] When providing a Response 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 Delivery Date Identifier

- Modify Product Order Item Delivery Date State

[R69] The Seller response **MUST** echo back all attributes and values from the Buyer's request.

[R70] The Seller Modify Product Order Item Delivery Date Identifier **MUST** remain the same value for the life of the Modify Product Order Item Delivery Date.

10.5 Charge

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

10.5.1 Initiate Charge

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

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

[R71] When the Seller initiates the Charge, the following, as defined in Table 47 **MUST** be included:

- Charge Identifier

- Product Order Identifier

- Charge Item Identifier(s)

- Response Due Date

- Charge State

[R72] When the Seller initiates a Charge for a Product Order Item or a Modify Product Order Item Delivery Date, the following as defined in Table 47 **MUST** be included:

- Product Order Item Reference Identifier

[R73] For each Charge Item included in the Charge, the Seller **MUST** include the following attributes as defined in Table 48:

- Charge Item Identifier

- Charge Type

- Charge Description

- Charge Activity Type

- Blocking

- Charge Price

- Charge Item State

[R74] Table 54 shows the attributes that **MUST** be included in the Charge Item based on the Charge Type.

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

Table 54 – Price Type Required Information

10.5.2 Buyer Response to Charge

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

[R75] The Buyer's response to the Charge **MUST** update the following as defined in Table 48 for each Charge Item included in the Charge:

- Acceptance Indicator

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

10.6 Create Cancel Product Order Request

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

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

10.6.1 Buyer Create Cancel Product Order Request

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

[R78]   The Buyer's Create Cancel Product Order request **MUST** contain the following attributes as specified in Table 37:

- Product Order Identifier

- Product Order Version

- Cancel Product Order Contact

[O18]   The Buyer's Create Product Order Cancel Request **MAY** contain the following attributes as specified in Table 37:

- Cancellation Reason Type

- Cancellation Reason

10.6.2 Seller Create Cancel Product Order Response

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

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

[R80]   If the Seller Response Code indicates success, the Seller **MUST** specify the following attributes defined in Table 37 in the response:

- Cancel Product Order Identifier

- Cancel Product Order State

- Seller Contact

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

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

10.7 Retrieve Product Order List

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

10.7.1 Buyer Retrieve Product Order List Request

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

[O19] 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

[O20] The Buyer's Retrieve Product Order List request **MAY** contain any of the following attributes as defined in Table 34:

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

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

10.7.2 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.

[R83] 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

- Product Order Version

- Buyer Product Order Identifier

- Product Order Accept Date

- Product Order Cancellation Date

- Product Order State

- Project Identifier

- Product Order Create Date

- Product Order Final State Date

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

[R85] If the Seller Response Code indicates success but no matching Product Orders are found, the Seller **MUST** return an empty list.

10.8 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 3). This includes the Buyer's Retrieve Product Order by Product Order Identifier request and the Seller's Retrieve Product Order by Product Order Identifier response.

10.8.1 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.

[R86] The Buyer **MUST** include the Seller Product Order Identifier as specified in Table 32 in their Retrieve Product Order by Product Order Identifier request.

10.8.2 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.

[R87] The Seller's response **MUST** comply with the states and attributes detailed in Table 55 and Table 56.

In Table 55 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
Product Order Version	R	R	R	R	R	R	R	R	R	R
Buyer Product Order Identifier	E	E	E	E	E	E	E	E	E	E
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
Seller Contact	R	R	R	R	R	R	R	R	R	R
Cancellation Reason				E – Buyer R- Seller						
Product Order Cancellation Date				R						
Product Order Expected Completion Date		R	R	O	R	O	O	R	O	
Product Order Final State Date				R		R	R		R	R
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 55 – Seller Response Product Order Attributes Based on Product Order State

In Table 56 the Product Order.Item attributes either Echoed from the Buyer's Create Product Order request shown by an "E", Required to be provided by the Seller shown by an "R", Required if Populated by the Seller shown by an "PR", or Optional to be provided by the Seller or the Buyer shown by an "O".

	ACKNOWLEDGED	CANCELLED	CANCELLING	COMPLETE	FAILED	HELD	IN_PROGRESS	PENDING	REJECTED	VALIDATED
Product Order Item Reference Number	E	E	E	E	E	E	E	E	E	E
Seller Product Order Item Identifier	R	R	R	R	R	R	R	R	R	R
Product Order Item Product Action	E	E	E	E	E	E	E	E	E	E
Product Order Item Product Identifier	E	E	E	E – Buyer R- Seller when assigned	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		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
Product Order Item Failed Date					R					
Product Order Item Expected Completion Date		R	R	R	R	R	R	R		
Product Order Item Completion Date				R						
Product Order Item POQ Attributes	E	E	E	E	E	E	E	E	E	E
Product Order Item State	R	R	R	R	R	R	R	R	R	R

	ACKNOWLEDGED	CANCELLED	CANCELLING	COMPLETE	FAILED	HELD	IN_PROGRESS	PENDING	REJECTED	VALIDATED
Product Order Item Quote Attributes	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		PR
Related Buyer Purchase Product Order Number	E	E	E	E	E	E	E	E	E	E
Buyer Billing Information	E	E	E	E	E	E	E	E	E	E
Termination Error					R				R	

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

10.9 Retrieve Modify Product Order Item Delivery Date List

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

10.9.1 Buyer Retrieve Modify Product Order Item Delivery Date List Request

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

[O21]   The Buyer's Retrieve Modify Product Order Item 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

- Requested Completion Date (range of dates)

- Modify Product Order Item Delivery Date State

- Modify Product Order Item Delivery Date Create Date (range of dates)

10.9.2 Seller Retrieve Modify Product Order Item Delivery Date List Response

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

[R88]   The Seller's response to the Buyer's Retrieve Modify Product Order Item Delivery Date List request **MUST** contain the following for each Modify Product Order Item Delivery Date Identifier that matches the filter criteria:

- Modify Product Order Item Delivery Date Identifier

- Modify Product Order Item 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 Delivery Date State

[R89] If the Seller Response Code indicates success, the Seller **MUST** specify at least zero or more Modify Product Order Item Delivery Date Identifiers in their response.

[R90] If the Seller Response Code does not indicate success, the Seller **MUST NOT** reply with any of the attributes in Table 36.

10.10 Retrieve Modify Product Order Item Delivery Date Details by Modify Product Order Item Delivery Date Identifier

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

10.10.1 Buyer Retrieve Modify Product Order Item Delivery Date Details by Modify Product Order Item Delivery Date Identifier Request

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

[R91] The Buyer **MUST** include the Seller Modify Product Order Item Delivery Date Identifier as specified in Table 36 in their Retrieve Modify Product Order Item Delivery Date Details by Modify Product Order Item Delivery Date Identifier Request.

10.10.2 Seller Retrieve Modify Product Order Item Delivery Date Details by Modify Product Order Item 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 Delivery Date Details by Modify Product Order Item Delivery Date Identifier Request.

[R92] If the Seller Response Code indicates success and a matching Modify Product Order Item Delivery Date Identifier is found, the Seller's response **MUST** include the following attributes as shown in Table 36 if they are provided in the Buyer's request:

- Modify Product Order Item Delivery Date Identifier

- Modify Product Order Item 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 Delivery Date State

[R93] If the Seller Response Code does not indicate success, the Seller **MUST NOT** reply with any of the attributes in Table 36.

10.11 Retrieve Cancel Product Order List

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

10.11.1 Buyer Retrieve Cancel Product Order List Request

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

[O22] The Buyer's Retrieve Cancel Product Order List Request **MAY** none or more of the following attributes as defined in Table 37:

- Product Order Identifier

- Cancel Product Order State

- Cancellation Reason Type

10.11.2 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.

[R94] The Seller's response to the Buyer's Retrieve Cancel Product Order List request **MUST** contain the following from Table 37 for each Seller Cancel Identifier that matches the filter criteria:

- Seller Cancel Product Order Identifier

- Product Order Identifier

- Product Order Version

- Buyer Product Order Identifier

- Note

- Cancel Product Order State

- Buyer Cancel Product Order Contact

- Seller Contact

- Cancellation Reason Type

- Cancellation Reason

[R95] If the Seller Response Code indicates success, the Seller **MUST** specify zero or more Cancel Identifiers in their response.

[R96] If the Seller Response Code does not indicate success, the Seller **MUST NOT** reply with any of the attributes in Table 37.

10.12 Retrieve Cancel Product Order by Seller Cancel Product Order Identifier

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

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

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

[R97] The Buyer **MUST** include the Seller Cancel Product Order Identifier as specified in Table 37 in their Retrieve Cancel Product Order by Seller Cancel Product Order Identifier Request.

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

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

[R98] The Seller's response **MUST** include the attributes per state of the Cancel Product Order as shown in Table 57.

In Table 57 the attributes are either Echoed from the Buyer's Request shown by an E, Required to be provided by the Seller shown by an R, Required to be provided by the Seller if populated shown by a PR, Optional to be provided by the Seller or Buyer shown by an O, or not included in the response shown by a blank in the cell.

Attribute	Response
Seller Cancel Identifier	R
Product Order Identifier	E
Product Order Version	E

Attribute	Response
Buyer Product Order Identifier	E
Note	Buyer – E Seller - PR
Cancel Request State	R
Cancel Request Contact	E
Seller Contact	R
Cancellation Type	E
Cancellation Reason	E

Table 57 – Seller's Response Cancel

10.13 Retrieve Charge List

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

10.13.1 Buyer Retrieve Charge List Request

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

[O23] The Buyer's Retrieve Charge List Request **MAY** contain one or more of the following attributes as defined in Table 47:

- Product Order Identifier

- Product Order Item Reference Number

- Response Due Date

- Charge State

10.13.2 Seller Retrieve Charge List Response

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

[R99] If the Seller Response Code indicates success, the Seller **MUST** echo back all attributes included in the Buyer's request.

[R100] If the Seller Response Code indicates success, the Seller **MUST** specify zero or more Charge Identifiers in their response.

[R101] If the Seller Response Code indicates success, the Seller's response to the Buyer's Retrieve Charge List request **MUST** contain the following from Table 47 for each Charge Identifier that matches the filter criteria:

- Charge Identifier

- Product Order Identifier

- Product Order Version

- Product Order Item Reference Identifier

- Charge Request State

[R102] If the Seller Response Code does not indicate success, the Seller **MUST NOT** reply with any of the attributes in Table 47.

10.14 Retrieve Charge Details by Charge Identifier

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

10.14.1 Buyer Retrieve Charge Details by Charge Identifier Charge Request

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

[R103] The Buyer **MUST** include the Charge Identifier as specified in Table 47 in their Retrieve Charge Details by Charge Identifier request.

10.14.2 Seller Retrieve Charge Details by Charge Identifier Charge Response

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

[R104] The Seller's response **MUST** include the attributes per Charge State as shown in Table 58.

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

Attribute	Reported
Charge Identifier	E
Product Order Identifier	R
Product Order Item Reference Number	R

Attribute	Reported
Charge Item Identifier	R
Response Due Date	R
Charge State	R

Table 58 – Seller's Response Charge

In Table 59 the attributes are either echoed from the Buyer's request shown by an E, required to be provided by the Seller shown by an R, optional to be provided by the Seller or Buyer shown by an O, or not included in the response shown by a blank in the cell.

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

Table 59 – Seller's Response Based on Charge Identifier State

10.15 Register for Notifications

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

10.15.1 Buyer Register for Notifications Request

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

[R105]   The Seller **MUST** support CHARGE_CREATE notifications.

[R106]   The Buyer **MUST** subscribe to CHARGE_CREATE notifications.

[O24]   The Seller **MAY** support Notifications.

[CR7]<[O24] 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 43.

[CR8]<[O24] If the Action attribute in the Buyer's Register for Notifications request is STOP, the Buyer **MUST** specify the List of Notification Types to be stopped.

10.15.2 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.

10.16 Seller Send Notification

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

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

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

[R109]   Notifications **MUST** include all Attributes shown in Table 44.

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

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

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

[R113]   If the Seller Object Identifier Type is MODIFY, the Notification **MUST** include the Modify Product Order Item Delivery Date Identifier.

10.17 Specifying the Buyer Identifier and the Seller Identifier

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

11 Product Ordering State Machines

State diagrams are used to give an abstract description of the behavior of a system. This behavior is analyzed and represented in a series of events, that could occur in one or more possible states. The below state diagrams and state definitions are adapted from TMF622 [10] (Product Ordering API REST Specification) and should be used to convey Product Order, Product Order Item, Cancel Process, and Charge states during the lifecycle of Product Ordering.

11.1 Product Order State Machine

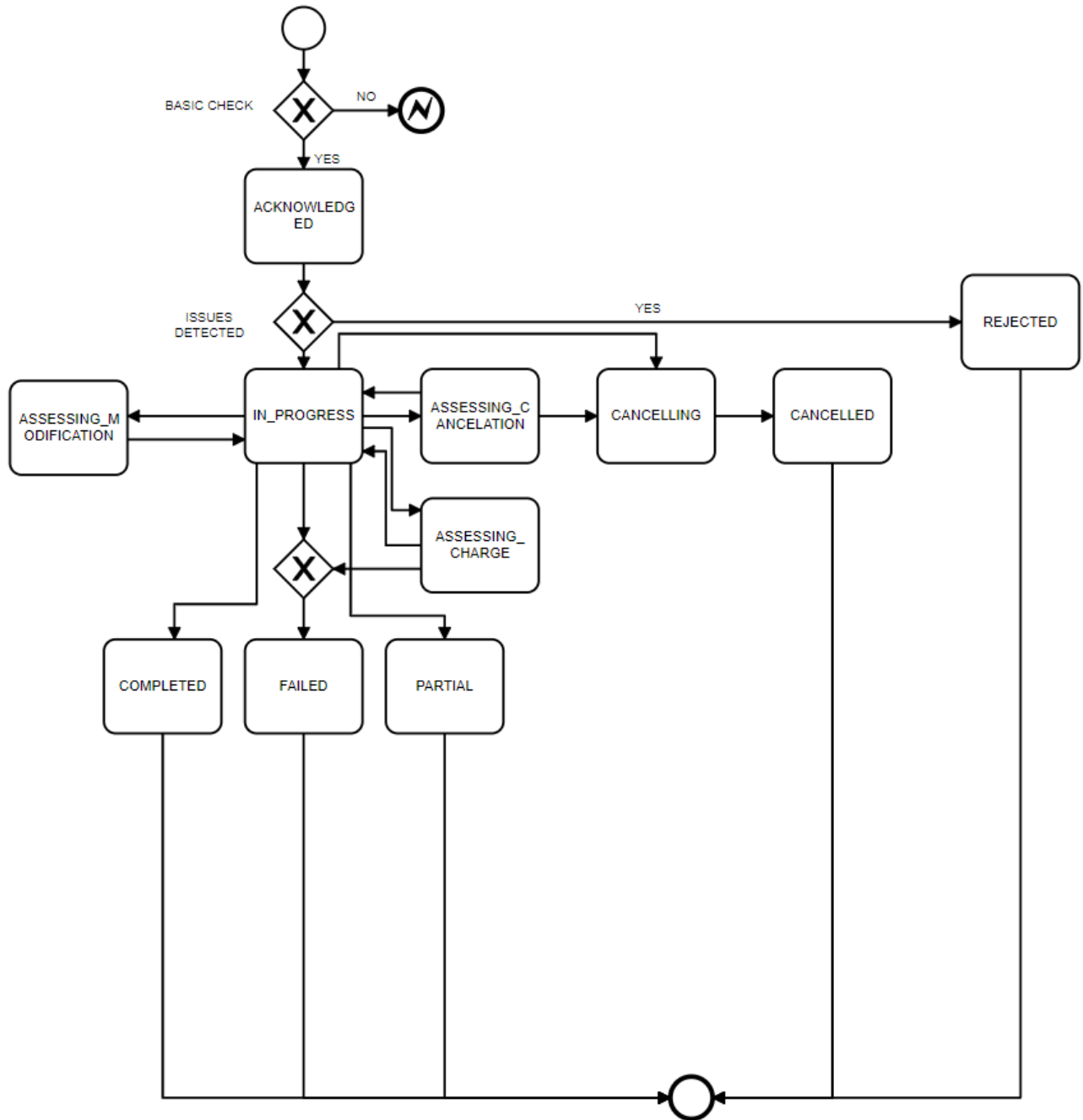The Product Order States and State Machines are detailed in this section.

Figure 5 – 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_CHARGE	A Charge has been initiated by the Seller that is not the result of a Modify Product Order Item or Cancel Product Order request and the Seller is awaiting a Buyer response to the Charge If a blocking or non-blocking charge is accepted by the Buyer, the Product Order moves to IN_PROGRESS. If a non-blocking charge is declined by the Buyer, the Product Order moves to IN_PROGRESS. If a blocking charge is declined by the Buyer and there are no unrelated Product Order Items in the Product Order, the Product Order moves to the FAILED state. If a blocking charge is declined by the Buyer and there are unrelated Product Order Items in the Product Order, the Product Order moves to the IN_PROGRESS state.
ASSESSING_MODIFICATION	A request has been made by the Buyer to modify the either the Expedite Indicator or the Requested Completion Date of a Product Order Item. The Product Order Item is currently being assessed to determine whether the Modify Product Order Item Delivery Date is valid. If there is a charge associated with the Modify Product Order Item 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

11.2 Product Order Item State Machine

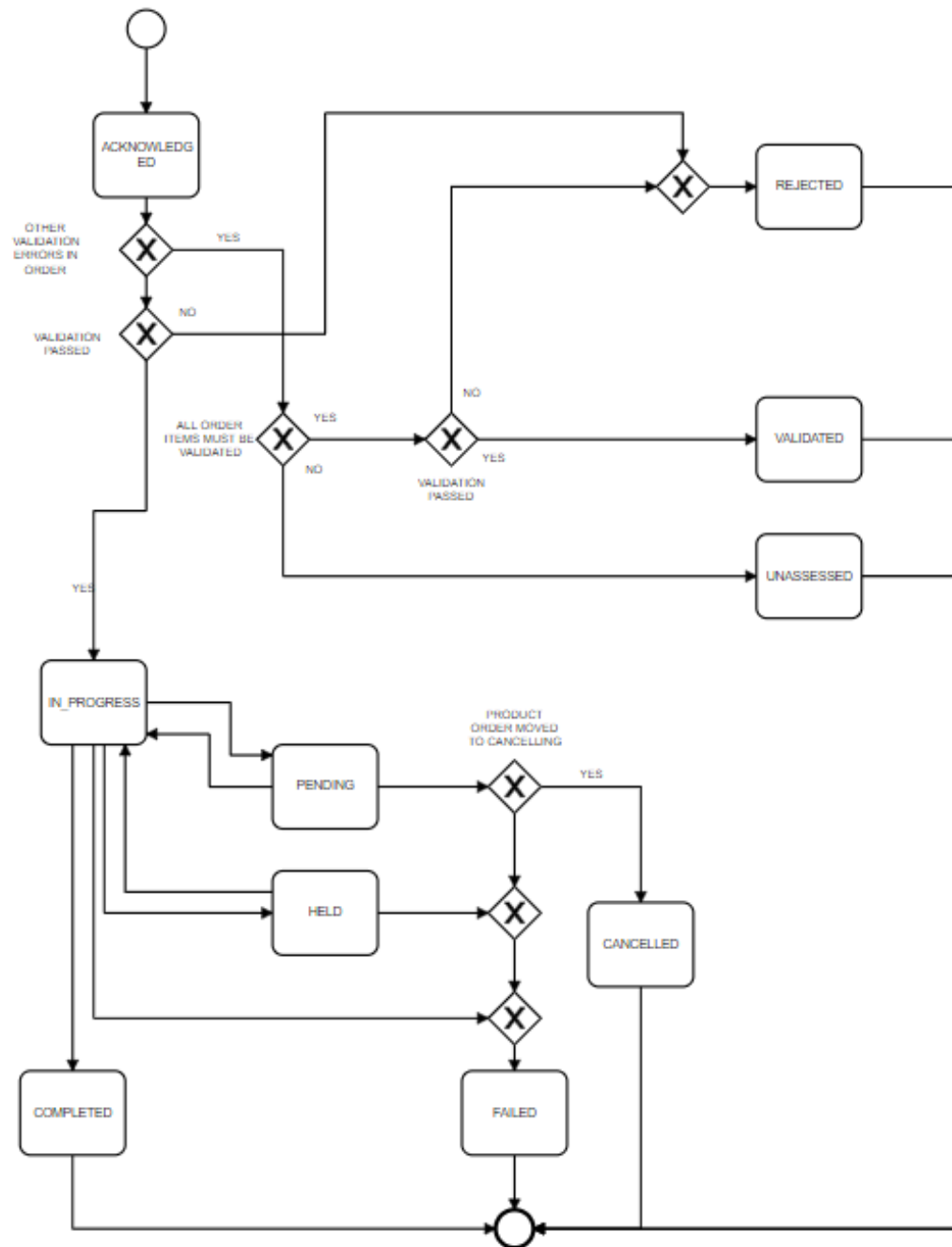The Product Order Item States and State machine are detailed in this section.

Figure 6 – 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.

PENDING	The Product Order Item cannot be progressed due to the Seller assessing a Cancel Product Order or Modify Product Order Item Delivery Date request. The Seller stops work on the Product Order Item until either the Cancel Product Order has been accepted and the Product Order state moves to CANCELLING and the Product Order Item state moves to CANCELLED, the Cancel Product Order has been rejected and the Product Order Item State moves to IN_PROGRESS, the Modify Product Order Item Delivery Date has been accepted and the Product Order Item State moves to IN_PROGRESS, or the Modify Product Order Item 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

11.3 Modify Product Order Item Delivery Date Process State Machine

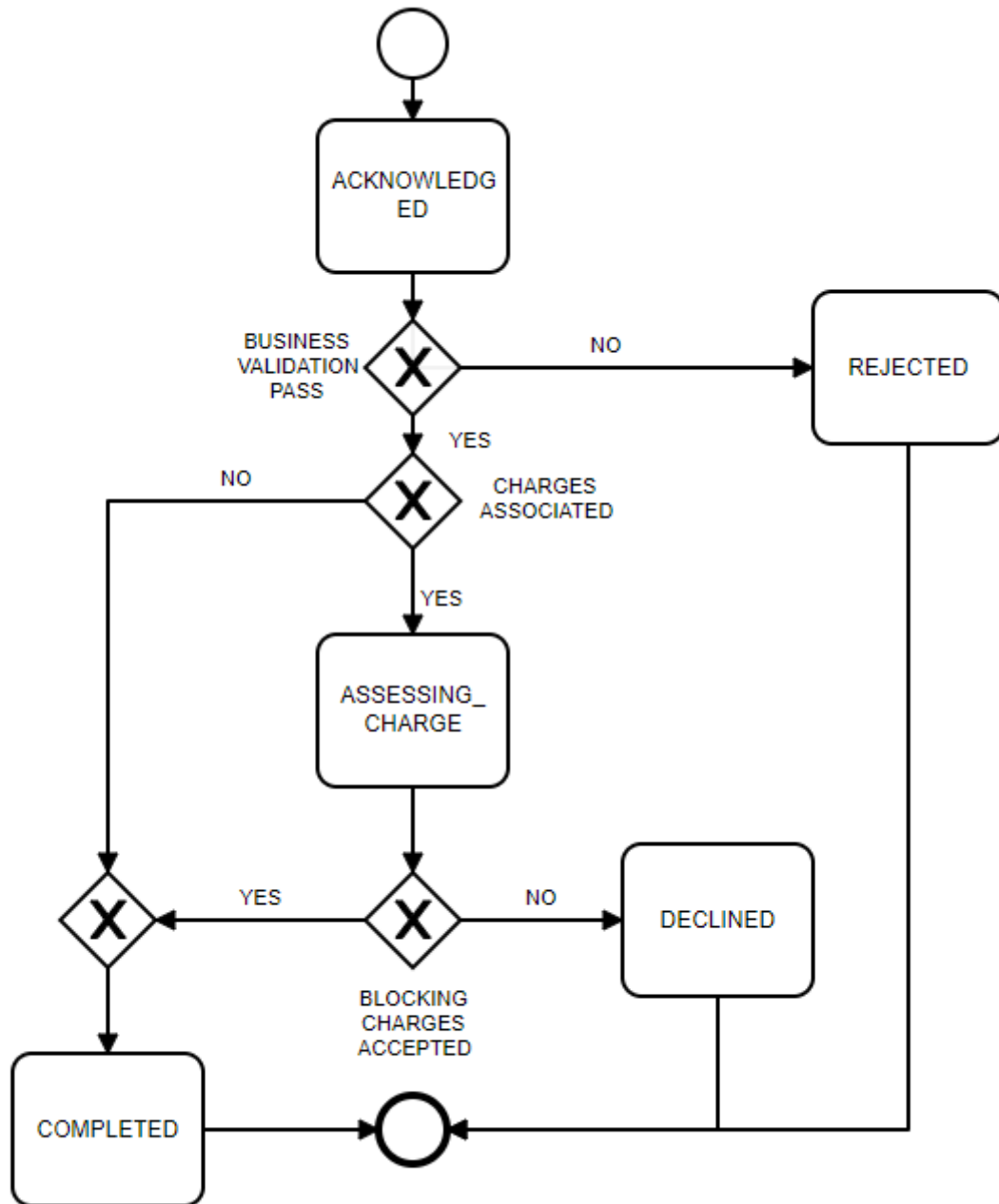The States and State Machines of the Modify Product Order Item Delivery Date Process are detailed in this section.

Figure 7 – Modify Product Order Item Delivery Date Process Flow

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

11.4 Cancel Product Order State Machine

The States and State Machines of the Cancel Product Order Process are detailed in this section.
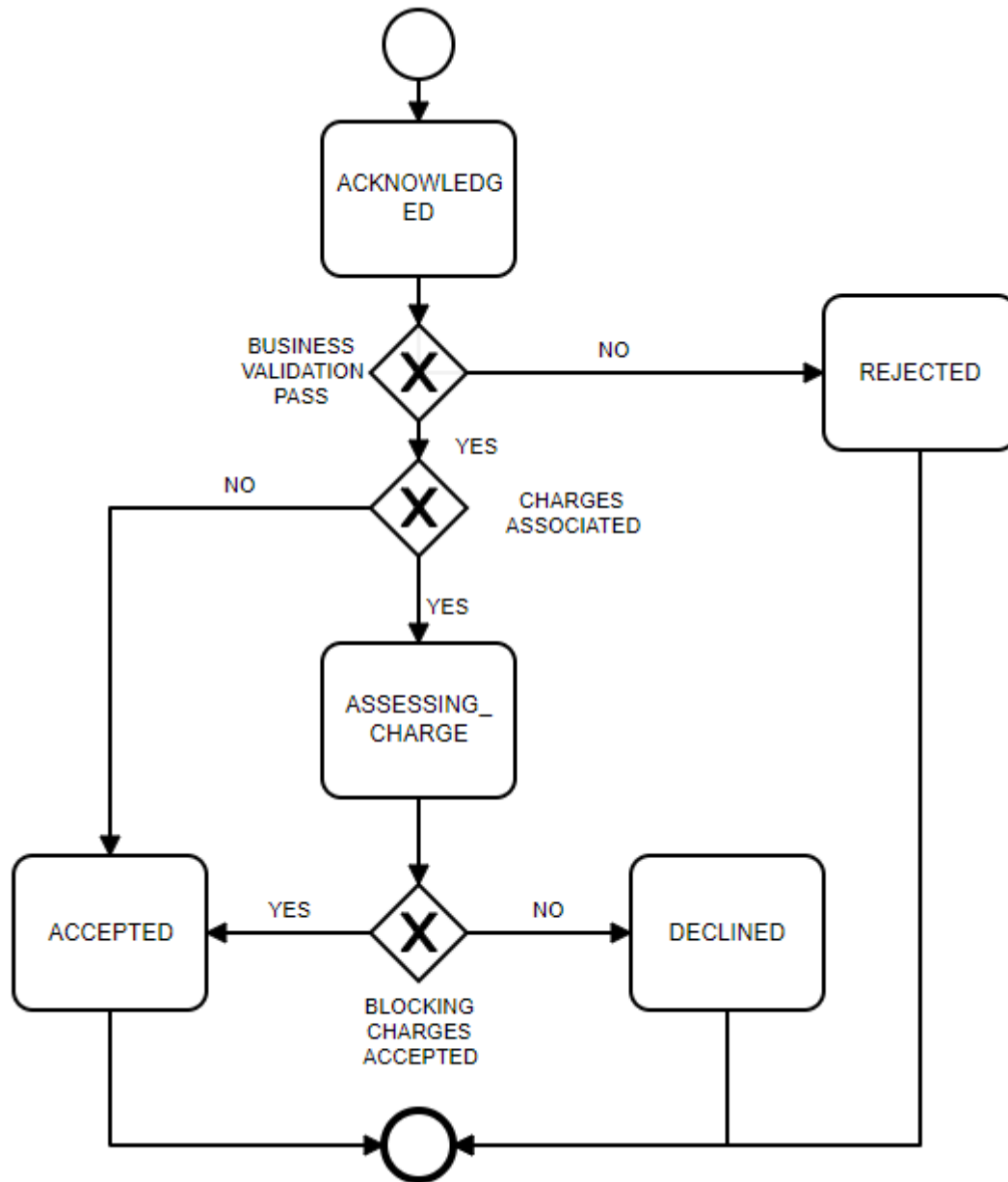
Figure 8 – Cancel Product Order Process Flow

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

Table 63 – Cancel Process Flow States

11.5 Charge State Machines

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

11.5.1 Charge Flow

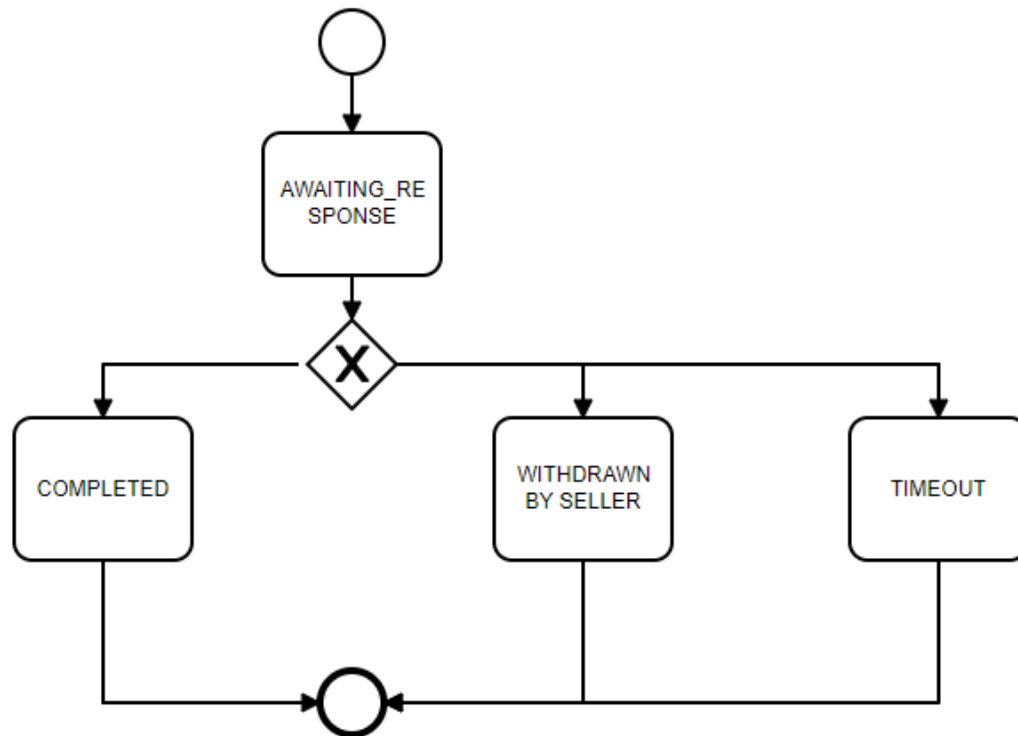The States and State Machine for the Charges detailed in this section.

Figure 9 – 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.
COMPLETED	All Charge Items included in the Charge for a given Product Order Item have moved to either the ACCEPTED state or the DECLINED state.
TIMEOUT	A response has not been received from the Buyer within the specified period of time. This is treated as if the Buyer declined the Charge Items.
WITHDRAWN_BY_SELLER	The Seller determines that the Charge is incorrect. They withdraw the Charge and initiate a new Charge with the required correction(s).

Table **64** – Charge Flow States

11.5.2 Charge Item State and State Machine

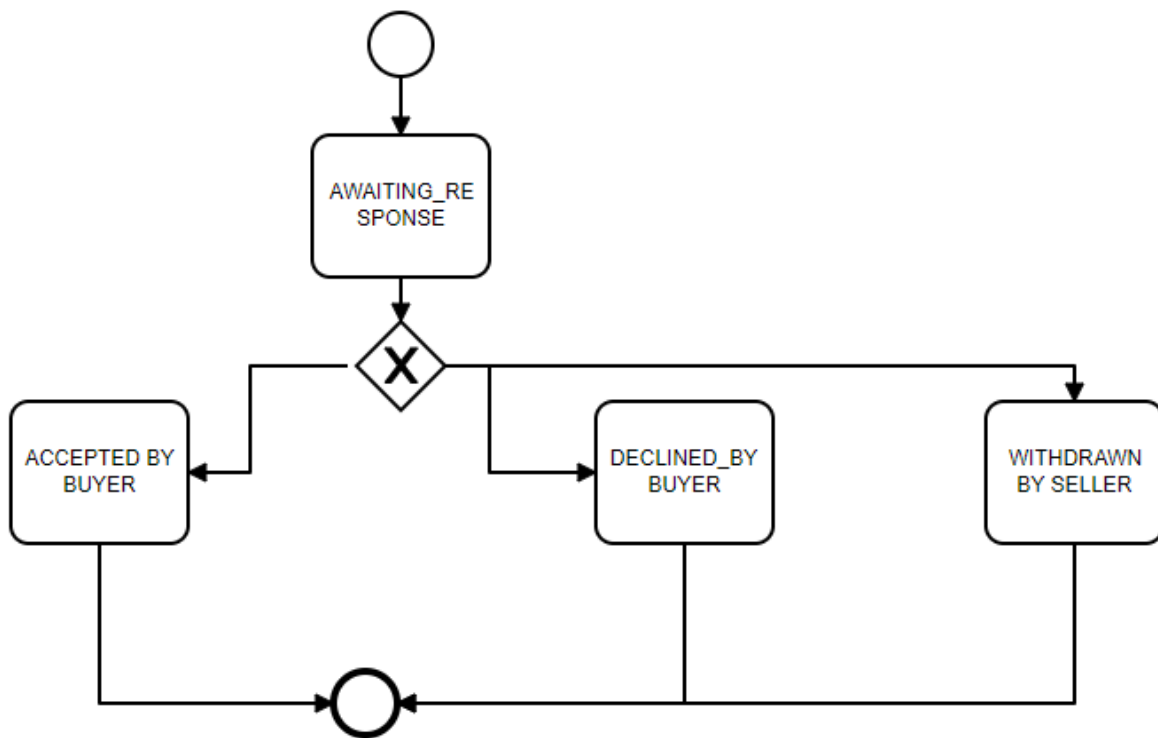The Charge Item process State Machine are detailed in this section.

Figure 10 – Charge Item Process

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

Table 65 – Charge Item Process Flow States

12 References

[1]   ATIS-0300253, *Structure for the Representation of Location Entities for Information Exchange*, December 2016

[2]   IETF RFC 2119, *Key words for use in RFCs to Indicate Requirement Levels*, March 1997

[3]   IETF RFC 8174, *Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words*, May 2017

[4]   MEF 50.1, MEF Forum, *MEF Services Lifecycle Process Flows, MEF 50.1*, August 2017.

[5]   MEF 51.1, MEF Forum, *Operator Services Definitions*, December 2018

[6]   MEF 55.1, 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*, Draft Standard, June 2020

[10]   TMF622 TM Forum, *TMF622 Product Ordering API REST Specification R17.5.1*, May 2018.

Appendix A Interactions Between Process Flows

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

A.1 Product Order Item to Product Order Interactions

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

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

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

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

Table 67 – Product Order Item REJECTED to Product Order State Mapping

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

Table 68 – One Product Order Item FAILED to Product Order State Mapping

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

Table 69 – All Product Order Items FAILED to Product Order State Mapping

A.2 Product Order to Product Order Item Interactions

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

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

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

	(T) Product Order Request Submitted	(T+1) Seller Completes

		Validation of all Product Order Items
Product Order	ACKNOWLEDGED	REJECTED
Product Order Item	ACKNOWLEDGED	REJECTED
Other Product Order Items	ACKNOWLEDGED	VALIDATED

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

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

Table 72 –Product Order PARTIAL to Product Order Item State Mapping

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

Table 73 – All Product Order Items FAILED to Product Order State Mapping