MEF

Working Draft 1.0

Serviceability Management Technical Specification
Business Requirements and Use Cases

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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.

Member Company

Table 1 - Contributing Member Companies

2   Abstract

This document identifies the common serviceability attributes and processes needed to support inter-carrier Serviceability requests. A Serviceability request, or "check", allows the Service Provider, or "Buyer" to determine during either the pre-sales or service-fulfillment phases whether sufficient physical and logical resources are on hand to provision a given service on behalf of a specific customer in a specified geographical location. This document supports the requirements defined in the MEF Lifecycle Service Orchestration (LSO) Reference Architecture and Framework (Section 8.11 Partner Management for LSO) for partner interactions over the Sonata interface. Information contained within this document will be utilized by both Buyer and Seller serviceability systems for the development of automated API systems.

3   Terminology and Acronyms

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.

Term	Definition	Reference
Access E-Line	An E-Access Service, based on the O-Line Service definition. For the purpose of this document, when the Access E-Line is a "port-based" service, it is also referred to as an Access-EPL.	MEF 51
Application Programming Interface (API)	In the context of Lifecycle Service Orchestration (LSO), API describes one of the Management Interface Reference Points based on the requirements specified in an Interface Profile, along with a data model, the protocol that defines operations on the data and the encoding format used to encode data according to the data model.	MEF 55
Buyer	A Buyer may be a Customer or a Service Provider who is buying from a Partner.	MEF 57
Carrier Ethernet Network (CEN)	A network from a Service Provider or network operator supporting the MEF service and architecture models.	MEF 12.1
Customer	A Customer is the organization purchasing, managing, and/or using Connectivity Services from a Service Provider. This may be an end-user business organization, mobile operator, or a partner network operator. Given the scenario in this document, the "customer" may be the end-customer (or subscriber) of the Service Provider, or the Service Provider who is a customer to Access Provider.	MEF 55
ENNI	A reference point representing the boundary between two Operator networks that are operated as separate administrative domains.	MEF 26.2
Feasibility	Used in this document as a synonym for serviceability	This document.
Fielded Address	An address whereby each item of address information is in a discrete field, i.e. "street number" is one field, "street name" is another field, etc.	This document
Formatted Address	An address that is formatted like a postal address.	This document
Minimum Point of Entry (MPOE)	An indicator whether full physical access has been given, or not, to a location.	This document
O-Line Service	A General OVC Service that uses a Point-to-Point OVC.	MEF 51

Term	Definition	Reference
OVC Endpoint	A logical entity at a given External Interface that is associated with a distinct set of frames passing over that External Interface i.e., UNI, ENNI.	MEF 26.2
Partner	An organization providing Products and Services to the Service Provider (Buyer) to allow the Service Provider to instantiate and manage products external to the Service Provider domain. In the context of Serviceability, this is the Seller.	MEF 55
Product Instance	Specific implementation of a Product Offering dedicated to the benefit of a party.	TMF GB922
Product Offering	An externally facing representation of a Service and/or Resource procurable by the Customer.	TMF GB922
Product Offering Qualification (POQ)	A step in the Serviceability process. The POQ provides a means to "qualify" a particular Product Offering for requested criteria.	This document
Product Offering Qualification Item	A product offering qualification is composed of one or more product offering qualification items, with each item representing serviceability for a given product.	This document
Product Offering Qualification Item Relationship	The relationship between product offering qualification items that can be used to validate business rules between POQ Items	This document
Product Specification	A Product Specification describes the invariant properties (i.e., features) that a given set of Products MAY have. These properties provide the information needed to plan, construct, allocate, and/or retire the Services and Resources from the operator environment needed to deliver the Product.	This document
Referenced Address	A reference that indicates the location of an entity.	This document
Related Party	An entity or organization that is involved in the product offering qualification. It may be the "Buyer", the "Seller", or other related party.	This document
Seller	A Seller may be a Service Provider or a Partner who is providing products to a Buyer.	MEF 57
Serviceability	Serviceability is the process whereby a Buyer requests from a Seller whether the Seller can provide a given service at a requested location. It also encompasses address validation, and retrieval of address/site information.	This document

Term	Definition	Reference
Serviceability Check	The "*Serviceability Request*, or "check" establishes during either the pre-sales or service-fulfillment phases whether sufficient physical and logical resources are on hand to provision a given service on behalf of a specific customer in a specified geographical location.	This document
Service Provider	The organization providing Ethernet Service(s).	MEF 10.3
Site	A spatial location of an actual or planned structure or set of structures (such as a building, floor, room, cell site, pole, etc.)	MEF 57.1
UNI	The physical demarcation point between the responsibility of the Service Provider and the responsibility of the Customer.	MEF 10.3
Use Case	A Use Case is a means to capture the requirements of a system(s). A system may have several Use Cases that define different aspects of its behavior	OMG UML v2.5

110   **Table 2 - Terminology and Abbreviations**

111 **4   Scope**

112 This specification defines the process for MEF Carrier Ethernet Serviceability Management be-
113 tween a Partner/Access Provider (Seller) and Service Provider (Buyer). At this time this docu-
114 ment is focused on Access E-Line services as defined in MEF 51. In the future this document
115 will remove references to specific services. The requirements for Serviceability Management
116 will be developed following a UML process approach which includes, but is not limited to,
117 Business Process Flows, Use Cases, Scenarios, Information Models, and State Machine Dia-
118 grams. This specification is limited to the business process requirements depicted as Use Cases
119 and attribute definitions needed for Serviceability Management. It will be the basis of require-
120 ments for three Data Models and three APIs: 1. Site Data Model and API, 2. Address Data Mod-
121 el and API, and 3. Product Offering Qualification Data Model and API.

122

5   Compliance Levels

The key words "**MUST**", "**MUST NOT**", "**REQUIRED**", "**SHALL**", "**SHALL NOT**", "**SHOULD**", "**SHOULD NOT**", "**RECOMMENDED**", "**NOT RECOMMENDED**", "**MAY**", and "**OPTIONAL**" in this document are to be interpreted as described in BCP 14 (RFC 2119 0, RFC 8174 0) 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 **OP-TIONAL**) are labeled as **[Ox]** for optional**.**

6   Introduction

Currently, in the Ethernet space, providers don't have a homogeneous process / method to verify Ethernet Serviceability for a given location. This Serviceability interface aims to remove carrier to carrier idiosyncrasies that currently exist by standardizing the way addresses and other information are exchanged between buying and selling Ethernet carriers during a serviceability request.
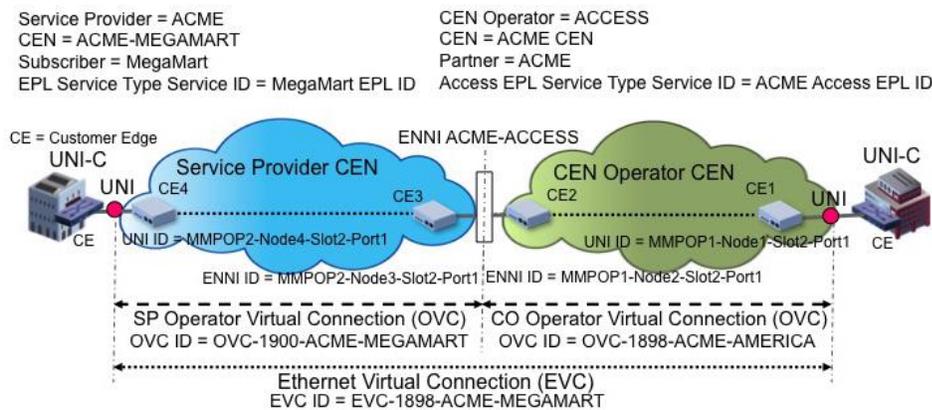
Figure 1 - Ethernet Serviceability Two Operator Topology View

The figure above illustrates the service topology view of a Service Provider (the Buyer) wishing to purchase an Access E-LINE service from a CEN Operator (the Seller) so that the Service Provider may offer an end-to-end EPL service to the MegaMart subscriber. In this view there are two customers represented, the Service Provider is a customer of the CEN Operator and the Subscriber is a customer of the Service Provider.

This specification defines the business requirements and process-related guidelines for Serviceability requests over the Sonata interface. Included functions are address and site validation, as well as product offering qualification requests. The Sonata interface is defined in MEF 55 as the Management Interface Reference Point supporting the management and operations interactions (e.g., ordering, billing, trouble management, etc.) between two network providers (e.g., 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".

To fully define the business interactions associated with inter-carrier serviceability, this document is focused on the following key areas:

- Serviceability Use Cases and Business Process Definitions

- Serviceability attributes supported in this document

- State Diagrams for Serviceability.

7   Requirements

R1: A Buyer MUST support the Buyer side of all <u>use cases</u> described in this specification.

R2: A Seller MUST support the Seller side of all use cases described in this specification.

R3 A Buyer's request MUST contain all <u>serviceability attributes</u> as specified in this specification as "requests" per use case.

R4: A Seller's response MUST contain all serviceability attributes as specified in this specification as "responses" per use case.

R5 The Seller MUST support all the states and their associated state transitions as specified in the product offering qualification <u>state machine</u> and product offering qualification item <u>state machine.</u>

8　Serviceability Use Cases and Business Process Definitions

8.1　High Level Use Cases

This section provides a set of business related Use Cases needed to support Serviceability, including address and site validation, and expands on the serviceability ("feasibility") process defined in MEF 50.1 (Determine Party Pre-Order Feasibility process element in the Lead Response-to-Contract process flow). These Use Cases are based on business process standards of interactivity between Buyers and Sellers of Ethernet Products. There are 3 associated "patterns" to the interactivity between the Buyer and Seller when the Buyer issues a Serviceability request:

1. The Seller may respond immediately with the results of the request
2. The Seller may acknowledge that he got the request, will process it, and send notifications to update the Buyer on the status (assuming the Buyer has subscribed to receive the notifications)
3. The Seller may indicate he is unable to process the request

The specific attributes associated with each Use Case are defined in the section Serviceability Attributes.   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 a Serviceability check (Product Offering Qualification). The Buyer may perform address validation prior to issuing a Serviceability request. However, if this is not done, the Serviceability check will perform address validation. The Serviceability API is assumed to be "product-agnostic", which means that the API can support a Serviceability check for any product in the Seller's system without a change to the API. The characteristics of the product are found in an associated product specification.

There are five different Access E-Line Related Products, defined in MEF 51, for which a Serviceability check can be performed, as an example

1. *ACCESS E-Line* (corresponds to an OVC)
2. *UNI CE Endpoint* (corresponds to an OVC endpoint on a UNI)
3. *ENNI CE Endpoint* (corresponds to an OVC endpoint on an ENNI)
4. *UNI*
5. *ENNI*

Other MEF 51 defined products are outside the scope of this document.

204   **8.2   Serviceability Use Cases**

205   This section defines the use cases that support Address Validation and Address/Site Retrieval, as
206   well as Serviceability checks between a Buyer and a Seller. To receive notifications, the Buyer
207   must first subscribe to them and provide a location for the Seller to send the notifications for
208   processing. For more information on how notifications work, see the Serviceability API Devel-
209   oper Guide.

210
211
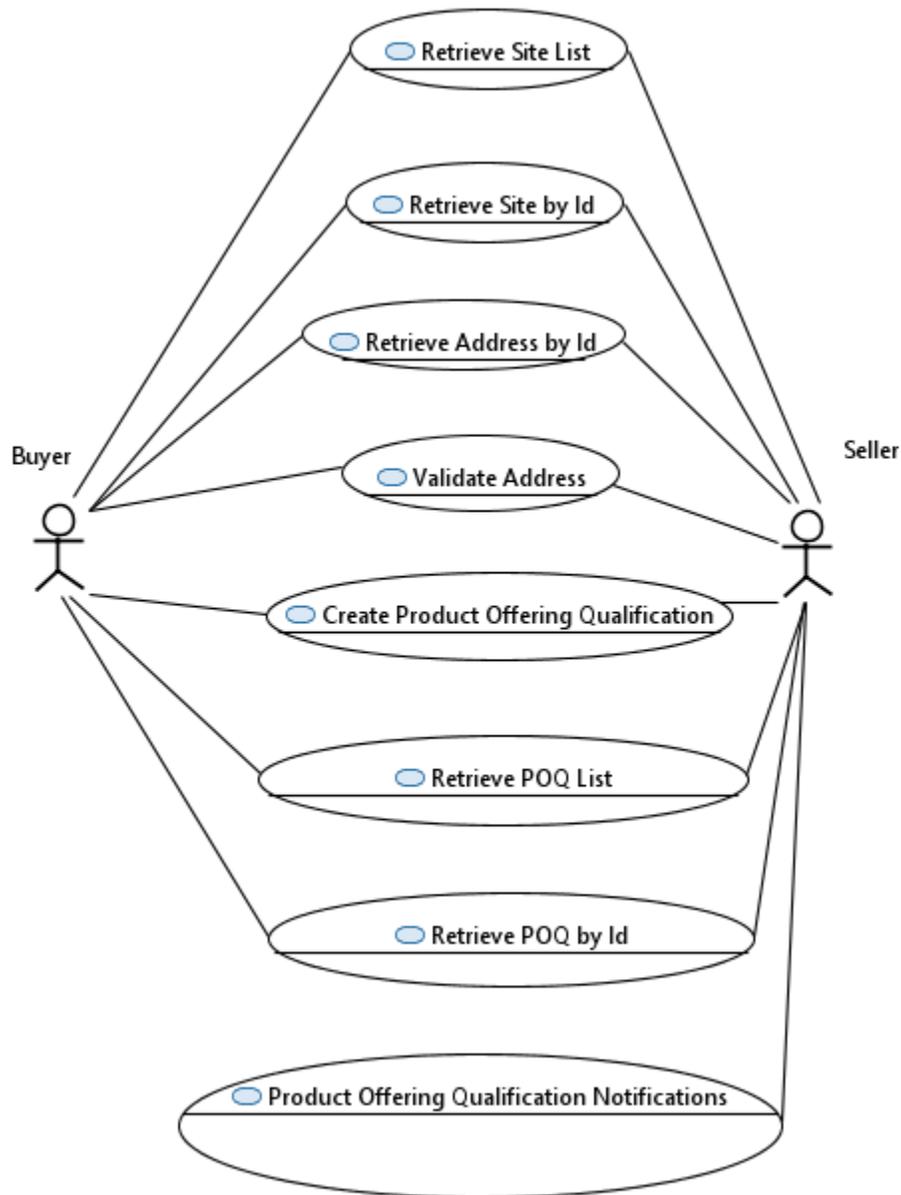
212   **Figure 1 - Serviceability Use Cases**

213

214

Use Case #	Use Case Name	Use Case Description
1	Retrieve Site List	The Buyer requests a list of Sites from the Seller based on Site/Address filter criteria.
2	Retrieve Site by Id	The Buyer requests a single Site based on a Site identifier.
3	Retrieve Address by Id	The Buyer requests a single Address based on an Address identifier.
4	Validate Address	Validate an address of a given location.
5	Create Product Offering Qualification (POQ)	A request initiated by the Buyer to determine whether a product can be delivered to a specific customer site (UNI) within a Seller's domain. This is achieved through the creation of a product offering qualification.
6	Retrieve POQ List	The Buyer requests a list of Product Offering Qualifications from the Seller based on POQ filter criteria.
7	Retrieve POQ by Id	The Buyer requests a single Product Offering Qualification based on a POQ identifier.
8	Product Offering Qualification Notifications	The Seller sends the following types of notifications to the Buyer who has subscribed to these notifications - POQ creation - POQ state change - POQ attribute value change

215   **Table 3 - Serviceability Use Case Table**

216   This section defines the details for each Serviceability use case.

217

Field	Description
Use Case Number	1
Use Case Name	Retrieve Site List
Description	The Buyer requests a list of Sites from the Seller based on Site/Address filter criteria.
Actor	Buyer/Seller

Pre-Conditions	1. Buyer has executed partnerships with an existing Seller with access to the region, for authorization to use API.
	2. The Buyer knows which filtering attributes to specify. The filter includes the following attributes:
	   • status
	   • siteCompanyName
	   • siteCustomerName
	   • geographicAddress-> streetNumber
	   • geographicAddress-> streetName
	   • geographicAddress-> streetType
	   • geographicAddress-> city
	   • geographicAddress-> postcode
	   • geographicAddress-> country

Process Steps	1. The Seller receives the request for site information from the Buyer.
	2. The Seller validates the filter.
	3. The seller returns a list of summarized site instances. The summary data for each site instance includes:
	   • id
	   • status
	   • siteCompanyName
	   • siteCustomerName
	   • geographicAddress-> streetNumber
	   • geographicAddress-> streetName
	   • geographicAddress-> streetType
	   • geographicAddress-> city
	   • geographicAddress-> postcode
	   • geographicAddress-> country

Post-Conditions	The Buyer has received a list of site information summary for 0 or more sites,
Alternative Paths	1. The Seller will return an error message if an error is encountered. The Buyer may submit a new request. 2. The Seller returns an empty list if no site meets the filter criteria.
Business Process	MEF 50.1 Lead-Response-to-Contract

218   **Table 4 - Retrieve Site List**

219

Field	Description
Use Case Number	2
Use Case Name	Retrieve Site by Id
Description	The Buyer requests a single Site based on a Site identifier.
Actors	Buyer/ Seller

Pre-Conditions	1. Buyer has executed partnerships with an existing Seller with access to the region for authorizing use of API.
	2. Buyer knows the site id of the site he wishes to retrieve.
Process Steps	1. The Seller receives the request and validates the identifier.
	2. The Seller determines if there is a site instance that matches the identifier.
	3. The Seller returns the matching site instance with all the attributes.
Post-Conditions	None
Alternative Paths	1. The Seller will return an error message if an error is encountered during processing.
	2. The Seller will return an error if the site instance with the specified site identifier is not found.
Business Process	MEF 50.1 Lead-Response-to-Contract

220

Table 5 - Retrieve Site by Id

221

Field	Description
Use Case Number	3
Use Case Name	Retrieve Address by Id
Description	The Buyer requests a single Address based on an Address identifier.
Actors	Buyer/ Seller
Pre-Conditions	1. Buyer has executed partnerships with an existing Seller with access to the region for authorizing use of API.
	2. Buyer knows the address id of the address he wishes to retrieve.
Process Steps	1. The Seller receives the request and validates the identifier.
	2. The Seller determines if there is an address instance that matches the identifier.
	3. The Seller returns the matching address instance with all the attributes.
Post-Conditions	None
Alternative Paths	1. The Seller will return an error message if an error is encountered during processing.
	2. The Seller will return an error if the address instance with the specified address identifier is not found.
Business Process	MEF 50.1 Lead-Response-to-Contract

222

Table 6 - Retrieve Address by Id

223

224

Field	Description
Use Case Number	4
Use Case Name	Validate Address
Description	Validate an address of a given location.
Actors	Buyer/ Seller
Pre-Conditions	1. Buyer has an identified off-net location with respect to a potential customer. 2. Buyer has executed partnerships with an existing Seller with access to the region, for authorizing use of API.
Process Steps	1. The Seller receives the address validation request on a location from the Buyer. 2. The Seller validates the required location information on the check: either latitude/longitude, postal address for the UNI location, or other location identifier. 3. If the address is valid, a positive response is returned with an address id.
Post-Conditions	The Buyer has received confirmation that the off-net location supplied in their request is a well-formed address (meaning the address is recognized) or an alternate address(es) exists (i.e, 123A, 123B, ...)
Alternative Paths	1. If the Seller cannot validate the given location at all, it returns a negative response. 2. If the Seller cannot find the given location due to it being ambiguous, the Seller may return a list of possible locations that are close to the requested location.
Business Process	MEF 50.1 Lead-Response-to-Contract

225   **Table 7 - Validate Address**

226

Field	Description
Use Case Number	5
Use Case Name	Create Product Offering Qualification
Description	A request initiated by the Buyer to determine whether a product can be delivered to a specific customer site (UNI) within a Seller's domain. This is achieved through the creation of a product offering qualification.
Actors	Buyer/ Seller
Pre-Conditions	1. Buyer has executed partnerships with an existing Seller with access to the region for authorizing use of API. 2. Buyer may have validated the address or the site previous to the product offering qualification request.

Process Steps	1. The Seller receives the request on a given location (address description, address id or site id) from the Buyer including the request response time. 2. The seller validates the request information for one of the following: a given product id, product offering id, or product spec id. 3. If the seller can service the request (confidence = "green"), the appropriate product proposal/product specification is returned. 4. If the seller can service the request possibly later (confidence=" yellow"), the appropriate product proposal/product specification is returned with an expected serviceability date. 5. If seller cannot service the request and the buyer has requested to receive alternatives, alternative product proposals/product specification are returned. (confidence=" yellow")
Post-Conditions	The buyer has received a response with a product offering qualification that is in a valid state.
Alternative Paths	1. If upon location validation an error occurs, an error message is returned. 2. In case the address description is provided and if there is no exact match (1-to-1) found, the request will be rejected as "Not Found". 3. If the Seller is completely unable to service the request, a negative response is set (confidence=" red").
Business Process	MEF 50.1 Lead-Response-to-Contract

227 **Table 8 - Create Product Offering Qualification**

228

Field	Description
Use Case Number	6
Use Case Name	Retrieve POQ List
Description	The Buyer requests a list of Product Offering Qualifications from the Seller based on POQ filter criteria.
Actors	Buyer/Seller
Pre-Conditions	1. Buyer has executed partnerships with an existing Seller with access to the region, for authorization to use API. 2. Buyer knows the filter criteria to formulate the request. The filter includes the following attributes: • state • expectedResponseDate • projectId 3. The Buyer may also request to return product offering qualifications starting at a specific index by specifying an "offset", or to limit the number of product offering qualification instances returned by specifying a "limit".

Process Steps	1. The Seller receives the request to retrieve a set of product offering qualifications.
	2. The Seller validates the filter.
	3. The Seller determines if there are any product offering qualifications that match the filter criteria.
	4. The seller returns a list of summarized product offering qualifications instances. The summary data for each POQ instance includes:
	   • id
	   • state
	   • requestedResponseDate
	   • projectId

Post-Conditions	The buyer receives a list of product offering qualifications that meet the filter.
Alternative Paths	1. The Seller will send an error if an error is encountered during processing. The Buyer may send a new request. 2. If the Buyer has specified an "offset", or "limit", only those product offering qualifications that correspond to the offset or limit will be returned. 3. The Seller returns an empty list if there are no product offering qualifications that meet the filter criteria.
Business Process	MEF 50.1 Lead-Response-to-Contract

229   **Table 9 - Retrieve POQ List**

230

Field	Description
Use Case Number	7
Use Case Name	Retrieve POQ by Id
Description	The Buyer requests a single Product Offering Qualification based on a POQ identifier.
Actors	Buyer/ Seller
Pre-Conditions	1. Buyer has executed partnerships with an existing Seller with access to the region for authorizing use of API. 2. Buyer knows the product offering qualification id of the POQ he wishes to retrieve.
Process Steps	1. The Seller receives the request and validates the identifier. 2. The Seller determines if there is a product offering qualification instance that matches the identifier. 3. The Seller returns the matching product offering qualification instance with all the attributes.
Post-Conditions	None

Alternative Paths	1. The Seller will return an error message if an error is encountered during processing. 2. The Seller will return an error if the product offering qualification instance with the specified product offering qualification identifier is not found.
Business Process	MEF 50.1 Lead-Response-to-Contract

231   **Table 10 - Retrieve POQ by Id**

232

Field	Description
Use Case Number	8
Use Case Name	Product Offering Qualification Notifications
Description	The Seller sends notifications for the following qualifying events: product offering qualification creation, product offering qualification state change, and product offering qualification attribute value change.
Actors	Seller
Pre-Conditions	1. One of the qualifying events has occurred. 2. The Buyer has subscribed to one or more product offering qualification notifications.
Process Steps	1. A notification is created for one of the following types of events: POQ creation, POQ state change, or POQ attribute value change 2. The Seller sends the notification to the location requested by the Buyer
Post-Conditions	The Buyer has received product offering qualification notifications.
Alternative Paths	None
Business Process	MEF 50.1 Lead-Response-to-Contract

233   **Table 11 - Product Offering Qualification Notifications**

234
235

9   Serviceability Attributes

This section identifies the attributes needed for each of the Serviceability Use Cases defined above. For each attribute, there is a description of the attribute, a type, and requirements, both behavioral and technical, placed on the attribute.

The "Requirements" specified below are only defined in the context of Serviceability; all characteristics of MEF-defined attributes should be referenced in the appropriate MEF Technical Specification document.

It is important to note that this section defines the superset of all MEF-defined attributes needed to support Serviceability 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.

The Access E-Line related product specifications, which are not intended to be part of the Inventory API (which is product agnostic) are not defined here. They are accessible in the MEF GitHub Product Specifications.

The columns in the table are as follows:
- **Attribute**   The name of the attribute
- **Description**   A short description of the attribute
- **Type**   String, integer, enumerations, or reference to another entry in the table
- **Comments**   Comments about the attribute.
- **UC**   The last two columns in the table represent use cases as defined in this specification, with each column having two entries, one for the "Req – Request" and one for the "Res – Response". For each one there is an indication of whether the attribute may be present or not (Y|N), and whether it is mandatory or optional (M|O) when specified.
    - N=NO
    - Y=YES
    - M=MANDATORY
    - O=OPTIONAL
  For example, Geographic Site -> id has N | YO for UC1 and YM | YO for UC2. That implies that for UC1, the "id" is not present in the request but is optionally present in the response. For UC2, it is present and mandatory in the request, and optionally present in the response.

270 **9.1 Geographic Site Retrieval Attributes**

271 A site may have either a Geographic Address or Geographic Location. If it is a Geographic Address, then one of the three types of ad-
272 dresses may be returned: fielded address, formatted address, or referenced address. As these use cases are only for retrieval of Geograph-
273 ical Site attributes, none of the fields are being updated.

274

Attribute	Description	Type	Comments	UC1 Req | Res	UC2 Req | Res
Geographic Site					
id	Unique identifier of the site	String		N | YO	YM | YO
description	A description of the site	String		N | N	N | YO
status	Status of the site	SiteStatus	This is an enumeration with values: • PLANNED • CANCELLED • UN-DER_CONSTRUCTION • EXISTING • FORMER	YO | YO	N | YO
siteName	The name of the Site	Site		N | N	N | YO
siteCompanyName	The name of the company that is located at the service location. This may be different from the name of the Buyer that ordered services at that site	String		YO | YO	N | YO
siteCustomerName	The customer name at a site where the service will be/are/were delivered	String		YO | YO	N | YO
additionalSiteInformation	Additional site information	String		N | N	N | YO
geographicAddress	The geographic address where the site is located.	Reference to Geographic Address		See Geo Address	See Geo Address
Geographic Address					**If present**

id	Unique identifier of the ad-dress	String	Present in fielded address	N | N	N | YO
streetNr	Number identifying a specific property on a public street. It may be combined with streetNrLast for ranged ad-dresses	String	Present in fielded address	YO | YO	N | YO
streetNrSuffix	The first street number suffix	String	Present in fielded address	N | N	N | YO
streetNrLast	Last number in a range of street numbers allocated to a property	String	Present in fielded address	N | N	N | YO
streetName	Name of the street or other street type	String	Present in fielded address	YO | YO	N | YO
streetType	Alley, avenue, boulevard, brae, crescent, drive, highway, lane, terrace, parade, place, tarn, way, wharf	String	Present in fielded address	YO | YO	N | YO
streetSuffix	in fielded address	String	Present in fielded address	N | N	N | YO
locality	An area of defined or unde-fined Present boundaries with-in a local authority or other legislatively defined area, usually rural or semi-rural in nature.	String	Present in fielded address Present in formatted address	N | N	N | YO
city	City that the address is in	String	Present in fielded address Present in formatted address	YO | YO	N | YO
postcode	Descriptor for a postal deliv-ery area, used to speed and simplify the delivery of mail (also known as zipcode)	String	Present in fielded address Present in formatted address	YO | YO	N | YO
stateOrProvince	The State or Province that the address is in	String	Present in fielded address Present in formatted address	N | N	N | YO
country	Country that the address is in	String	Present in fielded address Present in formatted address	YO | YO	N | YO

geographicSubAddress	Provides more detailed information about where the entity is location	Reference to a Geographic Sub-Address		See geoSubAddress	See geoSubAddress
geographicLocation	Provides latitude/longitude coordinates for the location	Reference to a Geographic Location		See geoLoc	See geoLoc
addrLine1	A formatted address line that contains a non-fielded street address.	String	Present in formatted address	N | N	N | YO
addrLine2	A formatted address line that contains a non-fielded street address, sub-address (e.g. Suite number), etc.	String	Present in formatted address	N | N	N | YO
postCodeExtension	The four-digit extension on an American postal code, what comes after the hyphen when specified.	String	Present in fielded address Present in formatted address	N | N	N | YO
referenceId	A reference to an address by id; this would include such things as Seller-assigned address identifiers.	String	Present in referenced address	N | N	N | YO
referenceType	A reference type of an address id	String	Present in referenced address	N | N	N | YO
Geographic Sub-Address					**If present**
id	Id of the sub-Address	String	Present in fielded address	N | N	N | YO
subUnitType	The type of subunit e.g.BERTH, FLAT, PIER, SUITE, SHOP, TOWER, UNIT, WHARF.	String	Present in fielded address	N | N	N | YO
subUnitNumber	The discriminator used for the subunit, often just a simple number e.g. FLAT 5, may also be a range	String	Present in fielded address	N | N	N | YO
levelType	Describes level types within a building	String	Present in fielded address	N | N	N | YO

levelNumber	Used where a level type may be repeated e.g. BASEMENT 1, BASEMENT 2	String	Present in fielded address	N | N	N | YO
buildingName	Allows for buildings that have well-known names	String	Present in fielded address	N | N	N | YO
privateStreetNumber	Private streets numbers internal to a private street	String	Present in fielded address	N | N	N | YO
privateStreetName	Private streets internal to a property (e.g. a university) may have internal names that are not recorded by the land title office	String	Present in fielded address	N | N	N | YO
Geographic Location					**If present**
geoPoint	Provides the coordinates	Reference to a Geo Point	Present in geographic address	N | N	N | YO
Geo Point					
spatialRef	Geocoding referential	String	Present in geographic address	N | N	N | YO
latitude	The latitude of the location	String	Present in geographic address	N | N	N | YO
longitude	The longitude of the location	String	Present in geographic address	N | N	N | YO

Table 12 - Geographic Site Retrieval Attributes

277   **9.2**   **Geographic Address Retrieval and Validation Attributes**

Attribute	Description	Type	Comments	UC3 Req | Res	UC4 Req | Res
Geographic Address Validation					
id	Unique identifier of the Address Validation	String	Set by the Seller	N | N	N | YO
status	Status of the address validation	GaStatusType	Enumeration with one of the possible values: • IN_PROGRESS • TERMINATED_WITH_ERROR • DONE Set by the Seller	N | N	N | YO
validationDate	Date when the address validation is performed	DateTime	Set by the Seller	N | N	N | YO
validationResult	The result of the address validation	ValidationResult	Enumeration with one of the following values: • SUCCESS • FAILS • PARTIAL Set by the Seller	N | N	N | YO
provideAlternative	Indicator provided by the requester to specify if alternate addresses must be provided in case of partial or fail result	Boolean	Set by the Buyer	N | N	YO | YO
validAddress	The address to be validated	Reference to a Geographic Address	Set by the Buyer.	See Geographic Address	See Geographic Address
alternateAddress	An alternative address provided	Reference to a Geographic Address	Set by the Seller if an alternative has been requested	See Geographic Address	See Geographic Address

Geographic Address					
id	Unique identifier of the address	String	Present in fielded address	YM | YO	N | YO
streetNr	Number identifying a specific property on a public street. It may be combined with streetNrLast for ranged addresses	String	Present in fielded address	N | YO	YO | YO
streetNrSuffix	The first street number suffix	String	Present in fielded address	N | YO	YO | YO
streetNrLast	Last number in a range of street numbers allocated to a property	String	Present in fielded address	N | YO	YO | YO
streetNrLastSuffix	Last street number suffix for a ranged address	String	Present in fielded address	N | YO	YO | YO
streetName	Name of the street or other street type	String	Present in fielded address	N | YO	YO | YO
streetType	Alley, avenue, boulevard, brae, crescent, drive, highway, lane, terrace, parade, place, tarn, way, wharf	String	Present in fielded address	N | YO	YO | YO
streetSuffix	in fielded address	String	Present in fielded address	N | YO	YO | YO
locality	An area of defined or undefined Present boundaries within a local authority or other legislatively defined area, usually rural or semi-rural in nature.	String	Present in fielded address Present in format-ted address	N | YO	YO | YO
city	City that the address is in	String	Present in fielded address Present in format-ted address	N | YO	YO | YO
postcode	Descriptor for a postal delivery area, used to speed and simplify the delivery of mail (also known as zipcode)	String	Present in fielded address Present in format-ted address	N | YO	YO | YO

stateOrProvince	The State or Province that the address is in	String	Present in fielded address Present in formatted address	N | YO	YO | YO
country	Country that the address is in	String	Present in fielded address Present in formatted address	N | YO	YO | YO
geographicLocation	Provides latitude/longitude coordinates for the location	Reference to a Geographic Location		See Geographic Location	See Geographic Location
addrLine1	A formatted address line that contains a non-fielded street address.	String	Present in formatted address	N | YO	N | YO
addrLine2	A formatted address line that contains a non-fielded street address, sub-address (e.g. Suite number), etc.	String	Present in formatted address	N | YO	N | YO
postCodeExtension	The four-digit extension on an American postal code, what comes after the hyphen when specified.	String	Present in fielded address Present in formatted address	N | YO	N | YO
referenceId	A reference to an address by id; this would include such things as Seller-assigned address identifiers.	String	Present in referenced address	N | YO	N | YO
referenceType	A reference type of an address id	String	Present in referenced address	N | YO	N | YO
Geographic Location					
geoPoint	Provides the coordinates	Reference to a Geo Point	Present in geographic address	See Geo-Point	See GeoPoint
Geo Point					
spatialRef	Geocoding referential	String	Present in geographic address	N | YO	YO | YO
latitude	The latitude of the location	String	Present in geographic address	N | YO	YO | YO

| longitude | The longitude of the location | String | Present in geo-graphic address | N | YO | YO | YO |

Table 13 - Geographic Address Retrieval Attributes

279

280 **9.3   Product Offering Qualification Attributes**

281 These attributes are used in the request for qualification of a product offering, and in the retrieval of product offering qualifications.

282

Attribute	Description	Type	Comments	UC5 Req | Res	UC6 Req | Res	UC7 Req | Res
Product Offering Qualification						
id	Unique identifier of the product of-fering qualification	String	This attribute is to be provided by the Seller on all response mes-sages.	N | YO	N | YO	YM | YO
state	The states used to convey the qualifi-cation status.	Enumeration	This attribute is to be provided by the Seller on all response mes-sages. The Seller is responsible for manag-ing the qualification status. Possible values include: IN_PROGRESS READY EXPIRED UNA- BLE_TO_PROVIDE ACCEPTED REJECTED Set by the Seller	N | YM	YO | YM	N | YM
projectId	An identifier that is used to group qualifications that represent a unit of functionality that is important to a Buyer	String	A Project can be used to relate multiple quali-fication requests to-gether. Set by the Buyer	YO | YO	YO | YO	N | YO
instantSyncQualifi-cation	If this flag is set to Yes, Buyer re-quests to have instant qualification to be provided in the response	Boolean	Set by the Buyer	YO | YO	N | YO	N | YO

provideAlternate	An indicator which when the value is "true" means that alternative solutions should be provided.	Boolean	If "true", the Seller is to support Product Alternatives in the response. Set by the Buyer	YO | YO	N | N	N | YO
expirationDate	The date the qualification response expires.	DateTime	The Seller may optionally choose to honor a future order request even after the qualification expires.	N | YO	N | N	N | YO
expecte-dResponseDate	The desired date for a response to the product offering qualification request.	DateTime	If the Seller cannot meet the expected date, he may choose to reject the request. Set by the Buyer	YO | YO	YO | YO	N | YO
relatedPartyRole	A reference to a set of Related Party Roles	Reference to Related Party Role	The product offering qualification has a list of associated related party roles. Set by the Buyer	YM | YM	N | N	N | YM
productOffer-ingQualifica-tionItem	The product offering qualification is composed of product offering qualification items.	Reference to a Product Offering Qualification Item	This is the list of associated product offering qualification items. Set by the Buyer	YM | YM	N | N	N | YM
Product Offering Qualification Item						
productOffer-ingQualifica-tionItemRefer-enceNumber	A	String	Set by the Buyer	YM | YM	N | N	N | YM

state	The states used to convey the qualification item status.	Enumeration	The state is set by the Seller. It may take one of the following values: 　IN_PROGRESS 　READY 　UNA- 　BLE_TO_PROVIDE 　ABANDONED	N | YM	N | N	N | YM
MPOE	Indicates if access to the location is currently Minimum Point Of Entry (MPOE) only.	Boolean	If MPOE is true, this indicates that full access to the physical location (e.g. sub-unit or suite) has not yet been established. If MPOE is false or not defined, this indicates that full access to the location has been (or will be) established. Set by the Seller	N | YO	N | N	N | YO
serviceabilityCon-fidence	The level of confidence of the Seller to be able to service the request.	ServiceabilityConfi-dence	Green: The request can be serviced. Yellow: The request may be able to be ser-viced. Red: The request can-not be serviced. Set by the Seller.	N | YO	N | N	N | YO
installationInterval	An estimate of the number of calen-dar days until the desired service could be activated.	InstallationInterval.	This is set by the Sell-er. It contains the time amount (i.e. 30) and the units (i.e. days)	N | YO	N | N	N | YO

						N | YO
desiredActiva-tionDate	The desired activation date for the service.	DateTime	This is set by the Buyer. Even if the Seller can't honor this date, he may proceed with the request.	YO | YO	N | N	
estimat-edResponseDate	When the color is Yellow (meaning 'We'll get back to you'), this date indicates when the Seller plans to provide a more complete response.	DateTime	Only conditionally set by the Seller.	N | YO	N | N	N | YO
terminationError	When the Seller can't process the serviceability request, he may return a list of reasons here.	TerminationError	Only conditionally set by the Seller.	N | YO	N | N	N | YO
product	The product to be qualified	Product	A product id passed as a reference from the Buyer	YM | YO	N | N	N | YO
productOffering	A product offering to be qualified	ProductOffering	A product offering passed as a reference from the Buyer.	YO | YO	N | N	N | YO

poqItemRelation-ship	The relationship between product offering qualification (POQ) items.	ProductOffer-ingQualifica-tionItemRelationship	A product offering qualification item may refer to another POQ item	YO | YO	N | N	N | YO
alternatePro-ductProposal	The list of alternate product pro-posals.	AlternatePro-ductProposal	The Buyer may have requested to get alter-nate product proposals if the Seller doesn't have a product that explicitly meets the needs of the Buyer.	N | YO	N | N	N | YO
eligibleProductOf-fering	A list of eligible product offerings	ProductOffering	When the Buyer has made a check against a product spec, this field returns the eligible product offerings.	N | YO	N | N	N | YO
Product Offering Qualification Item Relationship						
id	References the related POQ item.	String		YM | YM	N | N	N | YM
type	Specifies the nature of relationship to the related POQ item.	PoqItemType	Enumeration with one of the following values: RELIES_ON BUNDLED COMES_FROM	YM | YM	N | N	N | YM
AlternateProductProposal						
serviceabilityDate	When the alternate proposal can be put into service	DateTime	Format is YYYY-MM-DDThh:mmTZD (e.g. 1997-07-16T19:20+01:00)	N | YO	N | N	N | YO
productSpec	The product spec associated to the alternate product proposal.	ProductSpec	The product spec is referended by an id.	N | YO	N | N	N | YO
eligibleProductOf-fering	A list of eligible product offering(s)	ProductOffering	Each product offering is referenced by an id.	N | YO	N | N	N | YO

Product						
id	Unique (within the product domain) identifier for the product.	String	Uniquely identifies the Product for upgrade purposes. This is not known for new service request.	YO	YO	N	N	N	YO
productRelation-ship	A product may have a product rela-tionship with another product.	ProductRelationship	This is a reference to a product relationship.	YO	YO	N	N	N	YO
productSpec	The product spec associated with the product.	ProductSpec	Defines the characteris-tics of the product.	YO	YO	N	N	N	YO
place	The places that are associated to the product.	Place	This may be a refer-ence to a formatted or fielded address, a geo-graphic location, a ref-erence, or a site.	YO	YO	N	N	N	YO
Product Offering						
id	The unique identifier of the product offering.	String	Must be present if Product Offerings are referenced. This iden-tifier is provided by the seller and communicat-ed to the buyer during the on-boarding pro-cess	YO	YO	N	N	N	YO
Product Spec						

id	A unique identifier of the product specification.	String	This is a reference to the associated product specification. This identifier is provided by the seller and communicated to the buyer during the on-boarding process. Note: The attributes for the Product Spec are described in separate file as the Product Offering Qualification attributes are product agnostic and both sets of attributes will be used in the transaction.	YO | YO	N | N	N | YO
Related Party Role						
id	A unique identifier of the related party role.	String		YO | YO	N | N	N | YO
role	The role of the related party.	String	These are roles such as "Notification Contact", or "Customer". "Buyer" and "Seller" are mandatory.	YM | YM	N | N	N | YM
relatedParty	The related party associated to this role	Reference to a Related Party	The related party may be set by the Buyer	YM | YM	N | N	N | YM
Related Party						

id	A unique identifier of the related party.	String	These are the related parties that were associated with the product offering qualification.	YO | YO	N | N	N | YO
name	Name of the related party.	String	Mandatory field	YM | YM	N | N	N | YM
emailAddress	The email address of the related party.	String	Optional field	YO | YO	N | N	N | YO
telephoneNumber	The telephone number of the related party.	String	Mandatory field	YM | YM	N | N	N | YM
numberExtension	The telephone number extension of the related party.	String	Optional field	YM | YM	N | N	N | YM
Product Relationship						
id	The unique identifier of the product relationship.	String	The product id of the product to which another product is related.	YM | YM	N | N	N | YM
type	The type of relationship between products.	ProductRelation-shipType	Possible values: RELIES_ON BUNDLED COMES_FROM	YM | YM	N | N	N | YM
Place						

id	Unique identifier of the place.	String	This is an identifier that is common to all types of "places". The place is associated to the product	YO | YO	N | N	N | YO
role	The role of the place.	String	Possible values are: "UNI Site", or "ENNI Site".	YM | YM	N | N	N | YM
type	The type of place	String	The type of place. It may be FIELDED, FORMATTED, REF-ERENCE, GEO-GRAPHIC, or SITE. See MEF57 for further information.	YM | YM	N | N	N | YM

Table 14 - Product Offering Qualification Attributes

283

10 State Diagrams

10.1   Product Offering Qualification State Machine

The Product Offering Qualification state machine is shown below. The state diagram captures various states that POQ request goes through in its lifecycle. The specific states are managed by the Seller based on its processing and/or based on the Buyer's action. If the Buyer subscribes to Product Offering state change notifications, he will receive a notification every time the state changes
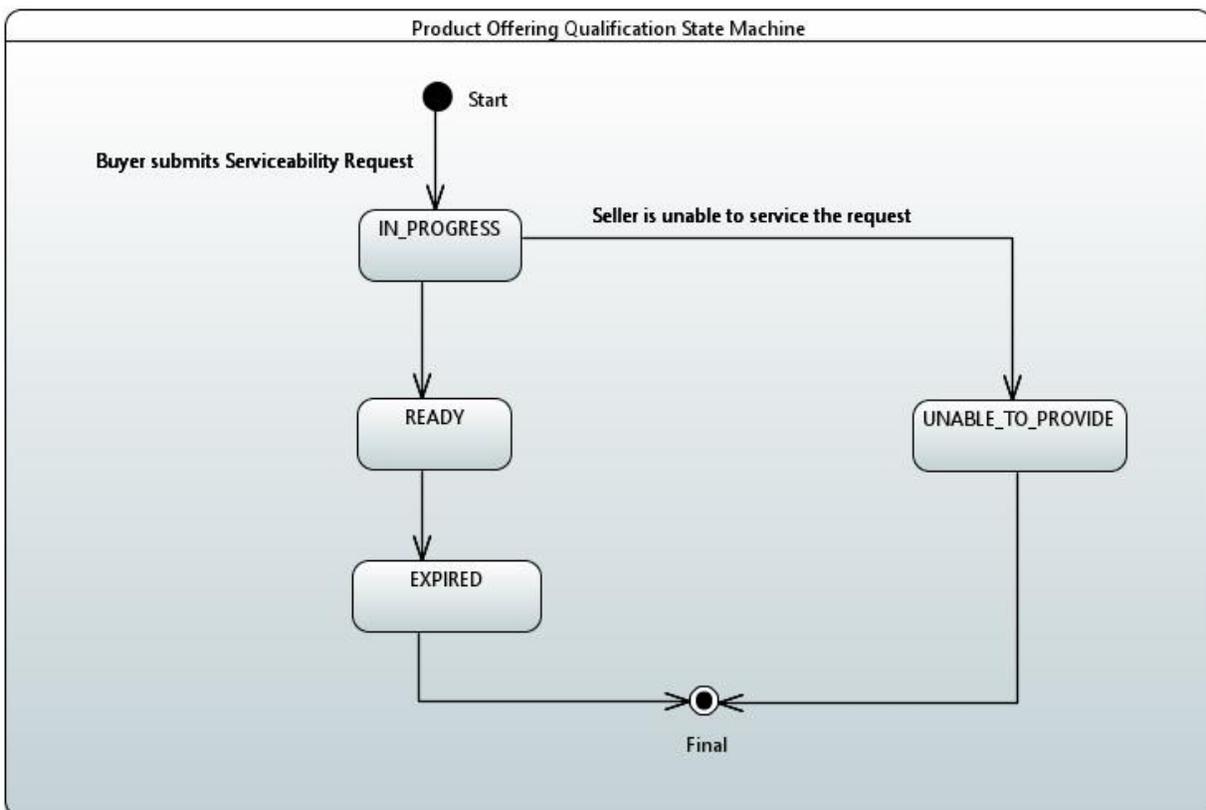

Figure 2 - Product Offering Qualification State Machine

294　The definitions of the various states are as follows:

295

State	Description
IN_PROGRESS	The IN_PROGRESS state is when the serviceability request (product offering qualification) is currently in the hands of the Seller.
READY	The READY state is where the product offering qualification has been internally approved by the Seller and sent to the Buyer.
EXPIRED	The Product Offering Qualification has expired.
UNABLE_TO_PROVIDE	This state is set by the Seller when he is unable to provide a product offering qualification.

296　　　　　　　**Table 15 - Product Offering Qualification State Values**

297　**10.2　Product Offering Qualification Item State Machine**

298　The Product Offering Qualification Item state diagram is shown below. The state diagram cap-
299　tures various states that the POQ Item goes through in its lifecycle. The specific states are man-
300　aged by the Seller based on its processing and/or based on Buyer's action.
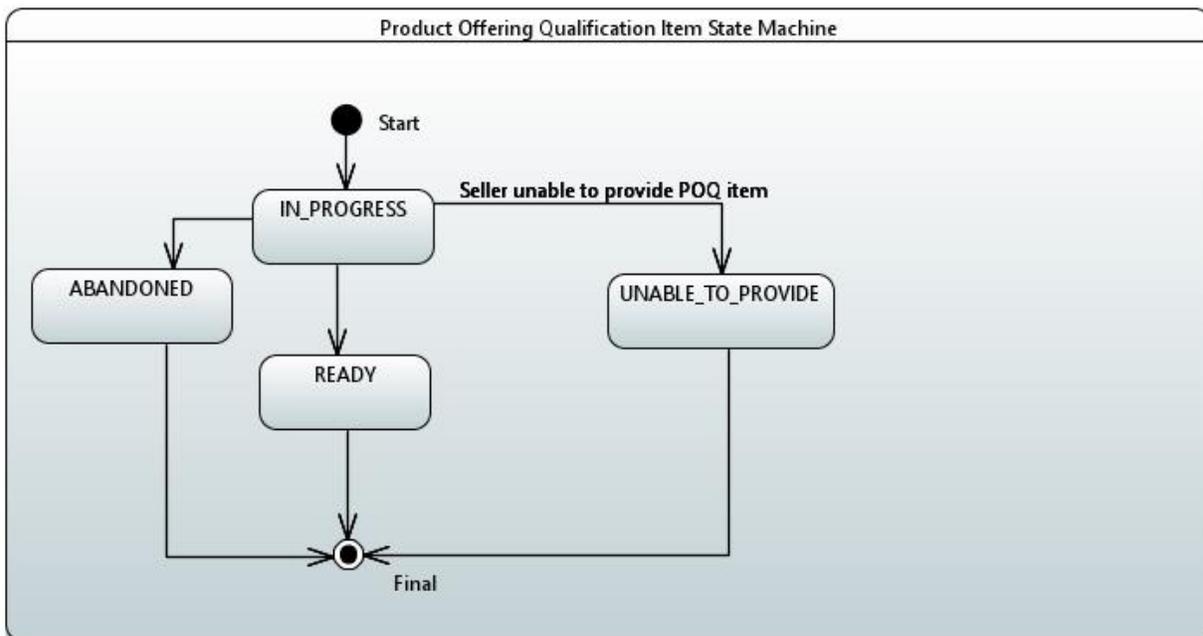
301

302　　　　　**Figure 3 - Product Offering Qualification Item State Machine**

303

304 The definitions of the various product offering qualification item states are as follows:

305

State	Description
IN_PROGRESS	The IN_PROGRESS state is when the POQ item is currently in the hands of the SP. The POQ item is under construction and should need more information.
UNABLE_TO_PROVIDE	The UNABLE_TO_PROVIDE state is set on a quote item when the seller cannot provide a product offering qualification for this item.
READY	The READY state is where the POQ item has been internally approved by the Seller.
ABANDONED	The ABANDONED state is applied to POQ items that are in an IN_PROGRESS state when the POQ is moved to a terminal state other than READY.

306 **Table 16 – Product Offering Qualification Item State Values**

307
308

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