**ISO New England RPLAN   
Data Exchange Specification**

This document is the data exchange specification for the ISO-NE RPLAN project using the **e-terra***renewableplan* product. This document is designed to assist ISO New England (ISO-NE) Wind/Solar Forecast Providers and Wind/Solar Plant Lead Participants in the development of their web services interface to the **e‑terra***renewableplan* web service application

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About This Document

This document describes the SOAP messages and the Authentication and Authorization process used to exchange forecast, narrative, and telemetry data between Forecast Providers and Plant Lead Participants through web service interfaces. This document explains how to access the RPLAN web service, presents the format and construction of SOAP messages used to exchange data, and briefly describes the Authentication and Authorization methods used to ensure security.

Purpose of this Document

This guide is designed to assist Forecast Providers and Plant Lead Participants to develop interfaces that interact and exchange forecast, narrative and telemetry data using the ISO-NE RPLAN web services. This document will help RPLAN Participants comprehend and construct the appropriate data messages essential for data exchange with the ISO-NE RPLAN web services.

This guide describes all the submit/query messages that can be constructed in order to exchange data between both Plant Lead Participants and Forecast Providers and the ISO-NE **e-terra***renewableplan* application. This guide specifies required and/or optional data in messages from RPLAN Participants and describes the data messages that can be requested from RPLAN web service application. This guide also describes the purpose and construction of SOAP messages, the adopted format for data exchange between all RPLAN Participants and the RPLAN web service application.

Scope and Prerequisite Knowledge

This document is intended to be used by all ISO New England RPLAN Participants involved in wind and solar integration as an aid in developing new interfaces.

Users of this Guide should be familiar with Extensible Markup Language (XML), Web Services, HTTP/HTTPS protocols, ISO New England’s governing documents, business rules and operating procedures as well as have a working understanding of how the energy market works and functions in New England. Refer to the References and Additional Information section for helpful links.

Structure of this Document

* Chapter 1 gives an overview of the RPLAN web service including RPLAN web service design and access, participant roles, and authentication and authorization
* Chapter 2 describes SOAP messages; from their construction to the format they are displayed in this document
* Chapter 3 describes restrictions and validations put on data submitted to RPLAN
* Chapters 4 describes the Forecaster Web Services
* Chapter 5 describes the Lead Participant Web Services

References and Additional Information

Additional information about Extensible Markup Language (XML), Web Services, and other helpful information can be found at the following links:

* XML –
* [http://www.w3.org](http://www.w3.org/standards/xml/) > XML Technology
* <http://www.w3schools.com> > Learn XML
* Web Services –
* [http://www.w3.org](http://www.w3.org/standards/webofservices/) > Web Service Technology
* <http://www.w3schools.com> > Learn Web Services
* SOAP –
* [http://www.w3schools.com](http://www.w3schools.com/soap/default.asp) > Learn SOAP

ISO New England governing documents include the Transmission, Markets & Services Tariff, ISO New England Manuals and Operating Procedures. In particular, Operation Procedures 14 and 18 deals specifically with wind communications. This documentation can be found at the following location:

* [http://www.iso-ne.com > Rules & Procedures](http://www.iso-ne.com/rules_proceds/index.html)

Change Summary

|  |  |  |  |
| --- | --- | --- | --- |
| Rev | Trans # | Date | Comments |
| 1.0 | 908E1798.1 | 02/27/10 | First released version transmitted to ISONE. |
| 2.0 | 908E1798.2 | 03/26/12 | Second version changes reflect comments created by ISONE, more generic data types, and endpoints that are based on the client. |
| 3.0 | 908E1798.3 | 05/02/12 | This version (v3.0) incorporates feedback from ISONE and the following new functionality and technical revisions:   * Ramp Event web service * XML namespace naming convention change * Operation-specific Faults (i.e., ForecastFault) compared to a single generic Fault |
| 4.0 | 908E1798.4 | 06/07/12 | This version incorporates:   * The ability to “cancel” Ramp Events by submitting empty data points * Specifies that UTC DateTime will be returned for all date and time values retrieved from the database |
| 5.0 | 908E1798.5 | 06/15/12 | This version incorporates:   * Specifying WPFA query operation for Forecaster, removing Daily and Hourly WPFA operations * Adding querying for WPFA for Wind Plant Lead Participants |
| 6.0 | 908E1798.6 | 06/28/12 | Changes include designated “Distributed Generation” as slated for development in a future release. |
| 7.0 | 908E1798.7 | 08/01/12 | Provided list of available authorization roles |
| 8.0 | 908E1798.8 | 08/13/12 | Replaced “Designated Entity” and variations with the corresponding “Lead Participant” variation. |
| 9.0 | 908E1798.9 | 09/07/12 | Updates to better align with the WSDL files along with general corrections. |
| 10.0 | 908E1798.10 | 09/12/12 | Minor updates to better support participant guide merging. |
| 11.0 | 908E1798.11 | 11/01/12 | Minor updates to align with WSDL updates. |
| 12.0 | 908E1798.12 | 02/10/16 | Updated to include references to new element AssetIdentifier (NE32205). Fixed the bug that was causing terminated username (i.e. old, changed name) to appear in the log together with the new name (NE32181) |
| 12.1 |  | 07/27/16 | Changes for Asset ID enhancement. Added Appendix A and removed the document (Wind Integration Enhancements for Asset ID.docx) from the bundle. (all changes in this version made by ISO-NE) |
| 12.2 |  | 03/08/21 | Enhancements for solar plants. Added Chapter 5. (all changes in this version made by ISO-NE)  - Updated RPlan to allow submittal and query of SPFA (Solar Plant Future Availability) for Solar Assets  - All (existing and new) Lead Participant Roles are updated |
| 12.3 |  | 08/01/22 | All edits for solar enhancements. |
| 13.0 | 908E1798.13 | 09/02/22 | Sent to ISO-NE via transmittal. |
| 13.1 |  | 09/09/22 | Minor updates from ISO-NE review. |
| 14.0 | 908E1798.14 | 9/12/2022 | Sent to ISO-NE via transmittal. |

# Web Service Overview

This chapter gives an overview of web service concepts associated with the RPLAN web service, how to access the web services, and the different roles.

## Web Service Design

The **e-terra***renewableplan* web service, or programmatic interface, is described by operations that are defined in the **e-terra***renewableplan* WSDL files. These operations also describe the messages that are used to transfer data between a participating parties and the **e-terra***renewableplan* application through the interaction between participating client interfaces and the **e-terra***renewableplan* web service. The web service operation messages use SOAP format for data transmission, which is discussed in more detail in chapter 2 entitled SOAP Messages.

All web service operations follow a request/reply pattern that is typical of HTTP(S) communication. A request may contain a message that modifies (or submits) data or it may contain a message that queries for data. A reply contains a message that is either: 1) a confirmation of data modification 2) an error (i.e., “fault”) or 3) the response to a query containing the results.

Any web service operation that allows data to be modified will have a corresponding web service query operation. In many cases, this web service operation pairing will have a submit message that contains the exact same data as a query response message. This relationship is referred to as having symmetrical messages. However, not all submit/query response messages are symmetrical. There are cases in which more data is returned in a query response message than can be contained in a submittal message (e.g., messages that contain telemetry data).

There are some web service operations that simply have query messages, and they are used for the sole purpose of requesting specific data from the **e-terra***renewableplan* application. A more in-depth description of the symmetry of web service operation messages used by the RPLAN web service can be found in section 2.6 Submittal and Query Response Symmetry.

The WSDL and the associated XML Schema Definition (XSD) file do not enforce the number of XML entities that are expected in any type of submission. For example, the WSDL operations provide the ability to submit forecasts but do not validate submittals for the appropriate number of forecasts at the expected time intervals; this type of validation occurs in the application layer. Additionally, a forecast submission that is technically valid according to the WSDL may not include all of the required data points. Missing Wind and Solar Plant forecast data will be monitored by the **e-terra***renewableplan* application and the appropriate alarm will be raised.

## Accessing the RPLAN Web Service

The **e-terra***renewableplan* web services are based on SOAP (version 1.1) over HTTPS (version 1.1). A client application that accesses the application can be written in nearly any modern enterprise technology and language, such as Java, .NET, C++, Ruby, PHP, etc. The web service is accessible to authorized participants through an ISO New England published URL, and all submittals and queries are serviced via the same URL.

Authentication to the interface uses digital certificates issued by ISO New England. Potential users need to register with the Customer Support department within ISO New England in order to obtain valid certification for access to the programmatic interface. Once the company is registered with ISO-NE, the Participant’s company appoints a Security Administrator (a member of their own staff) who in turn grants permissions (or roles) to the potential users of the RPLAN web service application or any other market application from that participant company. Users contact their own Security Administrator for roles to be opened on their certificates (which reside on their own computers). Refer to the [Customer Asset Management System Application Group Roles](http://www.iso-ne.com/support/user_guides/cams_application_group_roles.v4.xls) document on the ISO web page for [User Guides](http://www.iso-ne.com/support/user_guides).

The **e-terra***renewableplan* application will implement an already well understood Authentication and Authorization (A&A) architecture as well as the supporting processes that are already in place at ISO New England – that of the Market User Interface (MUI). Essentially, the **e-terra***renewableplan* will implement this architecture to create users, to manage users, to associate those users with defined roles, to perform user authentication, and to authorize user access to web service operations. A detailed design document for this architecture already exists; for more information on that architecture, please review the “*Market User Interface (MUI) Authentication and Authorization Delta Design Note”*.

In addition to adopting the aforementioned architecture, the **e-terra***renewableplan* application will also be extending its authorization capabilities. Specifically, the **e-terra***renewableplan* application’s schema will include additional tables that define relationships between participants and entities (i.e., a wind plant, meteorological “met” measurement, etc.) as well as between participants and different schedule types (i.e., forecasts, telemetry values, narratives, etc.). The **e-terra***renewableplan* application will use relationships defined in these tables to ensure that participants are authorized to access specific entities and schedules and to establish their permissions (i.e., read only, read/write) for each entity.

These relationships discussed above will utilize the A&A-provided PARTICIPANTID. Consequently, the processes by which participants are created and maintained will need to account for these additional authorization tables. For additional information regarding the design of these permission tables, please review the “*Wind Integration Phase 1 DDN*” and “RPLAN Solar DDN” documents.

Questions or inquiries about certifications for **e-terra***renewableplan* application access should be addressed to the Customer Support Department at ISO New England.

## Participant Roles

Roles define the web service operations/messages that an **e-terra***renewableplan* user can use to submit or query data. Distinct roles are associated with different web service operations (i.e., Forecast, Telemetry, Narrative, Ramp Event, etc.). Roles are also divided into two sub-types; “Read Only” and “Read/Write”. “Read Only” roles restrict the user to Query messages associated with their role’s web service operations, while “Read/Write” roles allow the use of both Submit and Query messages.

For example, a Forecast “Read/Write” role assigned to a user authorizes that user to invoke both the “QueryForecast” and “SubmitForecast” web service operations.

Following the conventions listed above, the following roles and their allowable operations are defined:

|  |  |
| --- | --- |
| **Role** | **Operations** |
| SuperUserRPlanRO | All query operations |
| SuperUserRPlanRW | All operations |
| FCSTRPlanRO | QueryCategories, QueryEntities, QuerySchedules, QueryForecast, QueryNarrative, QueryTelemetry, QueryRampRate |
| FCSTRPlanRW | SubmitForecast, SubmitNarrative, SubmitRampEvent, QueryCategories, QueryEntities, QuerySchedules, QueryForecast, QueryNarrative, QueryTelemetry, QueryRampRate |
| LPRPlanRO | QueryCategories, QueryEntities, QuerySchedules, QueryForecast |
| LPRPlanRW | SubmitForecast, QueryCategories, QueryEntities, QuerySchedules, QueryForecast |

## Web Service and XML Schema Definition Files

The ISONE RPLAN Web Services depends on three different files that are referenced throughout this document. The following table presents the list of these files, their namespaces, and a brief description.

| Filename | Namespace | Description |
| --- | --- | --- |
| ForecasterService.wsdl | urn:com.alstom.isone.windint.forecaster:1-0:wsdl | The Web Service definition describing the operations available to a “Forecaster” and how they should be accessed.  This web service file references only the XML elements contained in RPlan.xsd. |
| LeadParticipantService.wsdl | urn:com.alstom.isone.windint.lp:1-0:wsdl | The Web Service definition describing the operations available to a “Lead Participant” and how they should be accessed.  This web service file references only the XML elements contained in RPlan.xsd.  NOTE: This new entry point has a name not referring to “Wind” but is otherwise identical to the legacy entry point below. |
| WindPlantLeadParticipantService.wsdl | urn:com.alstom.isone.windint.wplp:1-0:wsdl | LEGACY ENTRY POINT: The Web Service definition describing the operations available to a “WPLP” and how they should be accessed.  This web service file references only the XML elements contained in RPlan.xsd. |
| RPlan.xsd | urn:com.alstom.isone.windint.windintegration:1-0 | Contains the elements specific to the ISONE RPLAN effort. The elements contained in top section of this file are referenced in each of the WSDL files. The elements defined in the Definition sections define simple and complex data types as explained in the table below |

The following table describes the elements and types defined in the Definition sections of the RPlan.xsd file. The Definition sections help organize the elements and types according to function and facilitate discussion in this document. The Definition sections are delimited by comments in the RPlan.xsd file.

| Definition Section | Description |
| --- | --- |
| CommonObjects | As discussed in 3.1.1.2, contains reusable (i.e., referenced at least twice) data type definitions. |
| CommonOperations | As discussed in 3.1.1.3, contains data type definitions that present the available Category, Schedule, Entities and associated permissions of the requestor. |
| PowerSchedule | Contains the data types for querying and submitting schedules related to power generation. This section is used to build the forecast-related querying and submittal elements.  The data types contained within this section satisfy the requirements to create the structures necessary for these forecasts:   * Short Term Wind and Solar Plant Forecast * Medium Term Wind and Solar Plant Forecast * Long Term Wind and Solar Plant Forecast * Hourly Wind and Solar Plant Future Availability * Daily Wind and Solar Plant Future Availability * Distributed Generation (Future) * Probabilistic Forecast |
| Narrative | Contains the data types for querying and submitting narratives. |
| Telemetry | Contains the data types for querying the actual data related to meteorological and power generation measurements. The structures defined in this section satisfy the requirements to exchange data for all identified met measurement and plant power telemetered data. |
| RampEvent | Contains the data types for querying and submitting probability-related data for both system and wind plant ramp events. |

# SOAP Messages

This chapter describes SOAP messages and how they are used in the **e-terra***renewableplan* application. This chapter describes constructing SOAP messages, restrictions on data submitted, and SOAP format/documentation in this guide.

SOAP is a specification for exchanging information involving Web Services. SOAP messages are constructed using Extensible Markup Language (XML) as a structure to store data. This XML structure is wrapped in a SOAP envelope that carries processing instructions and descriptions of the data for interpretation by an interface or Web Service. For reference, these operations are all described in Web Services Definition Language (WSDL) files (see section 1.4).

## Submit and Query Responses

Each message sent is an “all or nothing” event. The **e-terra***renewableplan* application will use database transactions, such that a commit will only occur on successful processing of an entire SOAP envelope. If an exception occurs while processing a message, a fault will be sent to the user with the appropriate error messages. Specifically, querying will not return any results and submittal transactions will be saved, however, they will be marked as invalid by the **e-terra***renewableplan* application.

<ForecastFault>

<!-- One or more repetitions -->

<error>

<message>?</message>

<number>?</number>

</error>

</ForecastFault>

Query messages return a wide variety of information, and as such they do not have a standard response message unless the message returns a fault similar to the one shown above. As the example above illustrates, the faults are named according to the type of operation invoked; however, each of these are merely instances of the same Fault element as is defined in the “*RPlan.xsd*” file. A description of each fault is contained within the web services sections 4 and 5; specifically, the first element presented in each the “Data Returned’ sub-sections.

Note that, similar to submit operations, query messages that contain invalid data are also treated as “all or nothing” events; invalid query response will return a fault.

Each Submit message that is sent to the **e-terra***renewableplan* application has a standard response message that confirms the message was received and processed. The response message contains a transaction ID that is used to track/indicate the confirmation of the message submitted. The standard response message to a Submit message is shown below

Standard Submit Response:

<soap:Envelope

xmlns:soap=*"http://schemas.xmlsoap.org/soap/envelope/"*>

<soap:Body>

<Submit?Response

xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<SubmitStatusResponse>

<success>

<!-- Only 1 repetition -->

<transactionId>?</transactionId>

</success>

</SubmitStatusResponse>

</Submit?Response>

</soap:Body>

</soap:Envelope>

## Format and Construction

SOAP messages are XML formatted structures wrapped in a SOAP envelope. XML formatted messages are organized with elements and attributes, and the structure looks very similar to HTML formatted messages. A simple XML message is shown below:

XML Message

<note>

<to>Mike</to>

<from>John</from>

<heading>Reminder</heading>

<body>Don't forget fishing this weekend!</body>

</note>

Messages used in the **e-terra***renewableplan* application look similar to the example above, however the XML formatted message is wrapped in a SOAP envelope. This SOAP envelope is shown below:

SOAP Envelope

<soapenv:Envelope

xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"*

xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

...

(XML Message here)

...

</soapenv:Body>

</soapenv:Envelope>

An XML formatted message and a SOAP envelope[[1]](#footnote-1) come together to form a SOAP message that is used to exchange data between a third party interface and a Web Service. With respect to the **e-terra***renewableplan* application, client interfaces are constructed and operated by participating plant operators (i.e., Lead Participants) and forecasters, while the Web Service is operated by ISO New England. An example of a complete SOAP message, an XML formatted message with a SOAP envelope, that is documented in this guide is shown below:

Full SOAP Format

<soapenv:Envelope

xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"*

xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:QueryForecast>

<wint:ScheduleRequest>

<wint:Schedule>

<wint:identifier>?</wint:identifier>

</wint:Schedule>

<wint:TimeRange>

<wint:fromTime>?</wint:fromTime>

<wint:toTime>?</wint:toTime>

</wint:TimeRange>

<wint:Entities>

<wint:Entity>

<wint:identifier>?</wint:identifier>

</wint:Entity>

</wint:Entities>

</wint:ScheduleRequest>

</wint:QueryForecast>

</soapenv:Body>

</soapenv:Envelope>

In examples like the one shown above, question marks indicate elements or attributes that should be populated with data. The wint: prefix that appears in each element of the XML body denotes an XML namespace that the **e-terra***renewableplan* application uses to avoid **naming** conflicts.

The example message above demonstrates the format of messages that exists throughout this document. This format is used because it shows the complete SOAP message template used to exchange data with the **e-terra***renewableplan* application web services. Each of the SOAP messages in the "Full SOAP Format" section of the web service operations can be used to submit/query data from the **e-terra***renewableplan* application, as long as the elements and attributes contain valid values. This document uses a color convention for distinguishing the various parts of the SOAP message. The color convention for items within these messages is shown below:

Element Element Value Attribute Attribute Value Comment

(brown) (black) (magenta) (blue) (green)

The **e-terra***renewableplan* application data that is contained within the SOAP body is defined in the WSDL and XSD files included in section 1.4. Within this document, the individual XML elements and attributes that comprise the **e-terra***renewableplan* application data are described in subsequent chapters and using a table format with the following column headings:

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |

**Opt**. – Indicates whether an element or attribute is optional

**Nil**. – Indicates whether an element or attribute is nillable

**Element or Attribute** – The name of element or attribute

**Data Type; Format** – Specifies the data type and format for the data

**Comments** – Specific information about the element or attribute

## Optionality and Nillability

Some messages contain elements and/or attributes that are optional. Element and group optionality is indicated in the XML Schema by specifying minOccurs=”0”. For element attributes, use=”optional” indicates optionality.

<complexType name=*"CategoryIdentityType"*>

<sequence>

<element name=*"identifier"* type=*"string"*   
 minOccurs=*"1"* maxOccurs=*"1"*/>

<element name=*"name"* type=*"string"* minOccurs=*"0"* maxOccurs=*"1"*/>

<element name=*"description"* type=*"string"* minOccurs=*"0"* maxOccurs=*"1"*/>

</sequence>

</complexType>

The next sections describe the conventions for handling optional attributes and elements that can be null. Note that we currently have no optional attributes or nillable elements.

### Submit Messages with Nillable Elements

Any element that is marked as nil=”true” will be interpreted as meaning "set the value in the database to NULL". The NULL value will be effective according to standard effective dating. A large number of Submit type messages contain elements that can be nil.

### Query Response Messages with Optional Attributes

Any Query Response message that contains optional attributes will have values for that attribute in the XML if the database has corresponding values. If the database does not have a corresponding value, the attribute tag will not appear in the XML.

### Query Response Messages with Nillable Elements

Any Query Response message that contains nillable elements will specify nil=”true” in the XML element if the database has a NULL value for that element.

## Query Filters

When querying data from the **e-terra***renewableplan* application, a RPLAN Participant will submit a query request message that contains filters to limit the data that is queried. Typical query filters include the Schedule identifier, the TimeRange, and the Entity identifier (i.e., Plant, System, DispatchZone, Met Measurement, etc.), though other filter criteria are possible depending on the nature of the data being queried (i.e., Category identifier, etc.). An example of a query message is shown below; the bold text identifies the query filter elements:

Full SOAP Message

<soapenv:Envelope

xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"*

xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:QueryForecast>

<wint:ScheduleRequest>

<wint:**Schedule**>

<wint:**identifier**>?</wint:identifier>

</wint:Schedule>

<wint:**TimeRange**>

<wint:**fromTime**>?</wint:fromTime>

<wint:**toTime**>?</wint:toTime>

</wint:TimeRange>

<wint:**Entities**>

<wint:**Entity**>

<wint:**identifier**>?</wint:identifier>

</wint:Entity>

</wint:Entities>

</wint:ScheduleRequest>

</wint:QueryForecast>

</soapenv:Body>

</soapenv:Envelope>

In this example, the Schedule and TimeRange are required elements, meaning that both must be included in the request. In addition, the Entity and Category (not shown) elements are optional – which are intended to further narrow the amount of data returned.

## Sample SOAP Message Format

The "Sample of Submittal (or Query)" message that follows each "Full SOAP Format" message in this document uses the full SOAP message, however the elements/attributes have made up values to show how data could be submitted. These sample messages also have the SOAP envelope, namespaces, comments, and party attributes removed in order reduce the overall length of this document. The samples below show the differences between a full SOAP message and its corresponding sample message. The full SOAP message below has the elements and attributes that are removed in its corresponding sample message highlighted in white.

­­­­<soapenv:Envelope

xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"*

xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:QueryForecast>

<wint:ScheduleRequest>

<wint:Schedule>

<wint:identifier>?</wint:identifier>

</wint:Schedule>

<wint:TimeRange>

<wint:fromTime>?</wint:fromTime>

<wint:toTime>?</wint:toTime>

</wint:TimeRange>

<wint:Entities>

<wint:Entity>

<wint:identifier>?</wint:identifier>

</wint:Entity>

</wint:Entities>

</wint:ScheduleRequest>

</wint:QueryForecast>

</soapenv:Body>

</soapenv:Envelope>

This full SOAP message would have this sample message documented below in a simplified format.

<QueryForecast>

<ScheduleRequest>

<Schedule>

<identifier>?</identifier>

</Schedule>

<TimeRange>

<fromTime>?</fromTime>

<toTime>?</toTime>

</TimeRange>

<Entities>

<Entity>

<identifier>?</identifier>

</Entity>

</Entities>

</ScheduleRequest>

</QueryForecast>

The SOAP envelope, namespaces, comments, and attributes that were removed in this example are common throughout this document; they will always be removed in sample messages. The sample message above will not process without the highlighted portions of the full SOAP message, with the exception of the lines of comments (indicated in green). Lines of comments are inserted in the full SOAP message to indicate optionality and element repetition, and a message will process with or without them. Note that the above example is taken from the Query message in the QueryForecast operation of the Forecaster Web Service (see section 4.0).

Sample messages may or may not have the elements/attributes that are optional included for the common reason of saving document length. It is important to note that a message will process with or without optional elements and attributes included, even though optional elements/attributes may not be shown in a sample SOAP message.

## Submittal and Query Response Symmetry

In general, the XML structure of the submitted data is almost identical to the Query response message. Specifically, optional elements used strictly for informational purposes (i.e., “name”) will be included in the query response. These same elements, however, will be ignored if included in a Query/Submit request. Ignored elements are excluded from the tables that define the inputs and outputs for the Web services.

The XML below shows sample data for a Submit message for a forecast.

<SubmitForecast>

<CreateSchedule>

<Schedule>

<identifier>1</identifier>

</Schedule>

<TimeRange>

<fromTime>2001-12-29T00:00:00Z</fromTime>

<toTime>2001-12-30T23:59:59Z</toTime>

</TimeRange>

<Entities>

<Entity>

<identifier>100</identifier>

<Power>

<time>2001-12-17T09:30:47Z</time>

<value>22.5</value>

</Power>

</Entity>

</Entities>

</CreateSchedule>

</SubmitForecast>

Except for the XML elements bolded below, the response to a Query message is identical to the Submit message.

**<QueryForecastResponse>**

**<ScheduleResponse>**

<Schedule>

<identifier>1</identifier>

<!-- **‘**name’ included for informational purposes -->

**<name>STWPFCST\_5MIN</name>**

</Schedule>

<TimeRange>

<fromTime>2001-12-29T00:00:00Z</fromTime>

<toTime>2001-12-30T23:59:59Z</toTime>

</TimeRange>

**<TimeInterval>300</TimeInterval>**

<Entities>

<Entity>

<identifier>100</identifier>

**<name>Wind Plant 001</name>**

<Power>

<time>2001-12-29T00:00:00Z</time>

<value>22.5</value>

</Power>

...

</Entity>

</Entities>

**</ScheduleResponse>**

**</QueryForecastResponse>**

## Query Response Format

Operations in this document are formatted in two distinct ways. One format is specifically for operations that have both submit and query messages, while the other is for operations that simply have a query message. The main difference between these two formats, aside from the submit/query message format having a submit message, is how the response message is documented in the Data Returned section. The submit/query message format shows the data returned within the response message, including the elements relevant to that message. The query message only format has the data returned by a response message, as well as the full SOAP response message with a sample response message. An example of each Data Returned section format is shown below.

Example: Query Message Only Data Returned Section

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | QueryForecastResponse | PowerScheduleResponseType | The outer most element containing all query results |
| No | No | ScheduleResponse | PowerScheduleDataType | The container element for each schedule returned; results are unbounded |
| Yes | No | TimeRange | DateRangeType | Contains the time range applied as a filter in the request. |
| No | No | TimeInterval | long | Describes the amount of time (in seconds) for the time-series data that follows (i.e., resolution) |
| No | No | name | string | The human readable “name” of the forecast schedule |
| No | No | time | dateTime: YYYY-MM-DDThh:mm:ss(Z|(+|-)hh:mm) | The “time” element captures the time the value was recorded |
| No | No | value | decimal | The “value” element contains the value of the measurement. |

Full SOAP Message

<soap:Envelope  
 xmlns:soap=*"http://schemas.xmlsoap.org/soap/envelope/"*>

<soap:Body>

<QueryForecastResponse  
 xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<ScheduleResponse>

<Schedule>

<identifier>?</identifier>

<name>?</name>

</Schedule>

<TimeRange>

<fromTime>?</fromTime>

<toTime>?</toTime>

</TimeRange>

<TimeInterval>?</TimeInterval>

<Entities>

<Entity>

<identifier>?</identifier>

<name>?</name>

<Power>

<time>?</time>

<value>?</value>

</Power>

</Entity>

</Entities>

</ScheduleResponse>

</QueryForecastResponse>

</soap:Body>

</soap:Envelope>

Sample of Query Submittal Response

<QueryForecastResponse>

<ScheduleResponse>

<Schedule>

<identifier>9905001</identifier>

<name>STWPFCST\_5MIN</name>

</Schedule>

<TimeRange>

<fromTime>2012-09-05T01:15:00-07:00</fromTime>

<toTime>2012-09-05T05:10:01-07:00</toTime>

</TimeRange>

<TimeInterval>300</TimeInterval>

<Entities>

<!-- 0 to unbounded Entity elements -->

<Entity>

<identifier>10245</identifier>

<name>BRKW</name>

<!-- 0 to unbounded Power elements -->

<Power>

<time>2012-09-05T08:15:00Z</time>

<value>1</value>

</Power>

</Entity>

</Entities>

</ScheduleResponse>

</QueryForecastResponse>

# Data Restrictions and Validation

In order for data to submit without error, basic validations must first be met. This chapter describes the validations/restrictions for data and messages that need to be met in order to submit messages to the **e-terra***renewableplan* application.

Basic validations are restrictions on data values submitted, ensuring the data is submitted at the right time according to market rules, and is submitted in the correct format/range. The following sections, "Data Type Validation" highlight these basic validations. This chapter is intended to outline the universal data restriction/validations necessary for submission of a message to the **e-terra***renewableplan* application.

It is recommended that the Data Type Validation sections be printed and used in parallel with constructing any web service operation messages. This will make referencing validations and value restrictions quick and simple.

## Data Type Validation

A basic type of data restriction/validation involves Data Types. A Data Type has restrictions associated with it that are used for submittal messages. A Data Type defines/restricts the range and format of numbers and strings. Data Types are defined and used in the **e-terra***renewableplan* XSD file (see section 1.4), which is linked to both of the **e-terra***renewableplan* WSDL files that provides the Web Service operation messages a participant submits/receives.

An individual Data Type is associated with a specific element or attribute of a web service operation message. Each attribute and element that is in a given message is listed, in this document, in a table located in the "Mandatory and Optional Fields" section of the message. This table not only shows the elements and attributes of an operation, but the data type and format associated with the element or attribute listed as well. In the tables, Data Types are displayed in the following format: Data Type; Format. An example of an element/attribute table that can be found throughout this document is shown below:

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | time | dateTime;  YYYY-MM-DDThh:mm:ss(Z|(+|-)hh:mm) | The forecast date and time. |
| No | No | identifier | string | Uniquely identifies a Category |

This table shows the element or attribute as well as the data type associated with it. The "Format" of the Data Type; Format column of the table is a short description of the type of data that is acceptable for submission.

### Data Types (table at bottom)

The following are the most common Data Types, and a description of the "Format" that follows them.

* In a “boolean” data type, either "true" or "false" is entered. This is indicated one of four ways in an element or attribute; true, false, 1, 0. True and the number one are equivalent, while false and the number zero are equivalent.
* In a “dateTime" data type, the format YYYY\_MM\_DDThh:mm:ss(Z|(+|-)hh:mm); tells that the time must be submitted in an hour:minute:second format with an attached hour:minute adjustment for a time zone preceded with a date in the same format as a Date data type and an intervening "T" character. An example of a time submitted for four o’clock P.M. on July 7, 2010 with a four hour time zone offset is 2010‑07‑07T16:00:00‑04:00.

#### Native XML Data Types

The table below shows the most common native XML data types and a brief description showing the exact strings, values, and/or ranges of data that can be submitted.

**Note**: The following types are native XML types. All other types are specifically defined for **e-terra***renewableplan*

| Data Type | Description |
| --- | --- |
| boolean | boolean. values are; true, 1, false, 0 |
| dateTime | **The** general format is YYYY-MM-DDThh:mm:ss(Z|(+|-)hh:mm); time must use 24-hour format and may not be negative. |
| decimal | Real number used for telemetry time-series data values. A real number, which can be represented by decimal numerals and (+) positive value is assumed if missing (as defined by the IEEE). |
| float | 32-bit floating-point numbers (as defined by the IEEE) |
| long | Integer value used primarily for ID’s |
| string | General purpose string (as defined by the IEEE) |

#### Common Objects Data Types

The following types are defined in the *CommonObjects Definition section* containing Data Type definitions referenced and extended by the other XML Schema Definition sections. All data types included in the *CommonObjects Definition section* can be considered reusable types that are referenced by at least two data types found in different XSD sections.

The documentation regarding the common object data types is presented in the following sections: first, a table containing a written description for each data type and its children; second, diagrams to help the reader understand the composition and cardinality between data types.

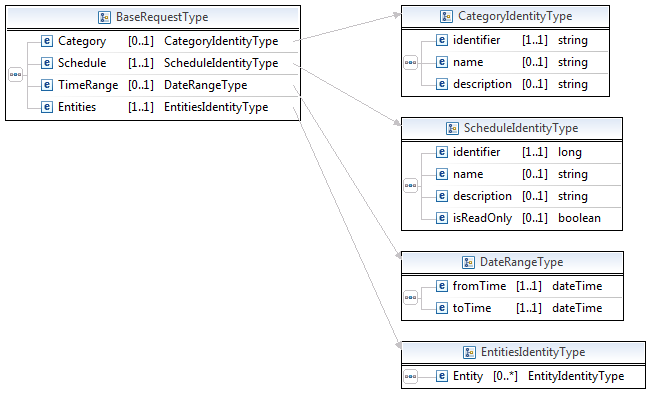
##### Data Type Description in Tabular Format

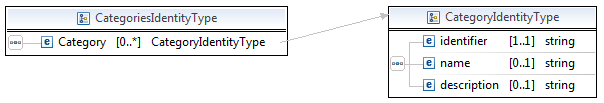
In the following table, the “Data Type” column provides the name of the data type, the “Children: Data Type” column specifies the children elements define contained within the parent, and the “Description” gives a brief description of the data type.

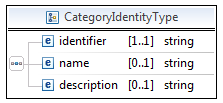
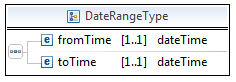
With respect to the “Children: Data Type” column example “fromTime: dateTime” specifies that the element name is “fromTime” and it is uses a “dateTime” data type.

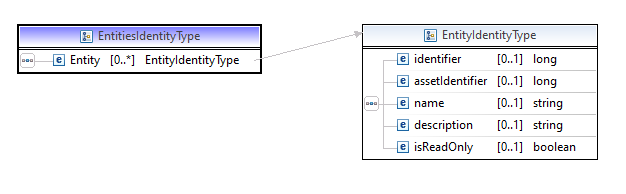
| Data Type | Children: Data Type  *\*Indicates a required element* | Description |
| --- | --- | --- |
| BaseRequestType | Category: CategoryIdentityType  Schedule: ScheduleIdentityType\*  TimeRange: DateRangeType  Entities: EntitiesIdentityType\* | Contains the elements that may be included in most requests, many of which are optional and usage depends on the specific use case. |
| CategoriesIdentityType | Category: CategoryIdentityType | Container element for a collection of Category elements. |
| CategoryIdentityType | identifier: string\*  name: string  description: string | Contains information identifying a Category.  The ‘identifier’ element is required to uniquely identify a Category and is a string  The “name” and “description” elements are meant to be immediately intelligible to a person and should be used for only informational purposes. The “name” element will be present for each query response. |
| DateRangeType | fromTime: dateTime\*  toTime: dateTime\* | Contains the dateTime elements representing a time range.  The “fromTime” element contains the beginning time of the range.  The “toTime” element specifies the ending time in the time range.  The time range is not constrained and depends largely on the use case.  “DateRangeType” values used in queries (i.e., “TimeRange”) retain the original time zone in the response message. |
| EntityIdentityType | identifier: long  assetIdentifier: long  name: string  description: string  isReadOnly: boolean | Contains information identifying an Entity.  Either the ‘identifier’ or the ‘assetIdentifier’ element is required to uniquely identify an Entity. They can both be provided.  The “name” and “description” elements are meant to be immediately intelligible to a person and should be used for only informational purposes. The “name” element will be present for each query response.  The “isReadOnly” element should be used by integrating applications to capture their access to a particular Entity. A “false” value is interpreted that they can submit as well as query; whereas “true” is query only. |
| EntitiesIdentityType | Entity: EntityIdentityType | Container element for a collection of Entity elements. |
| FaultType | error: TransactionVariance | Web service transactions that fail will return an “error” element containing specific information about the nature of the failure. |
| PowerEntityIdentityType  [extends EntityIdentityType] | Power: TimeValueSeriesType | In addition to the elements contained within the EntityIdentityType, adds a “Power” element that contains time-series data related to power generation. |
| ScheduleIdentityType | identifier: long\*  name: string  description: string  isReadOnly: boolean | Contains information identifying a Schedule. The application represents forecasts and telemetered values as ‘Schedules’.  The ‘identifier’ element is required to uniquely identify a Schedule.  The “name” and “description” elements are meant to be immediately intelligible to a person and should be used for only informational purposes.  The “isReadOnly” element should be used by integrating applications to capture their access to a particular Schedule. A “false” value is interpreted that they can submit as well as query; whereas “true” is query only. |
| SchedulesIdentityType | Schedule: ScheduleIdentityType | Container element for a collection of Schedule elements |
| ScheduleRequestType | ScheduleRequest: BaseRequestType\* | Container element wrapping the request for Schedules. |
| StatusResponseType | Success: SuccessStatusType | Contains a single “Success” element – which signifies a successful transaction. |
| SuccessStatusType | transactionId: string\* | A “transactionId” uniquely identifies a successful transaction. |
| SubmitStatusResponse | SubmitStatusResponse:  StatusResponseType | Wraps a “Success” element for each successful transaction. |
| TimeValueSeriesType | time: dateTime value: decimal\* | Contains time-series data. The “time” element captures the time the “value” was contains the value of the measurement. |
| TransactionIdType | transactionId: string\* | The “transactionId” element uniquely identifies an individual transaction. |
| TransactionVariance | message: string\*  number: int\* | Specifies errors related to a failed transaction  The error will have an associated unique number which is assigned to the message based on its placement within a collection of messages. If there are 20 “message” elements present, the value of the fifth element within that collection will be 5. |

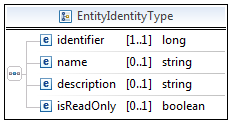
##### Data Type Relationships as Diagrams

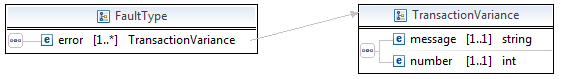


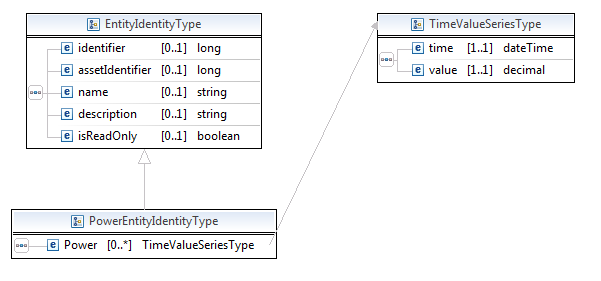


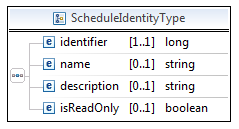
 

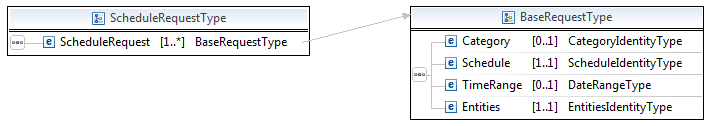


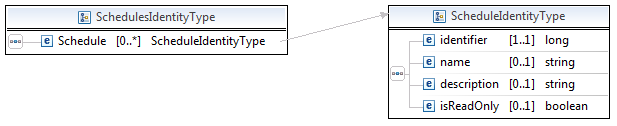






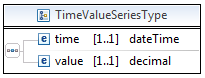


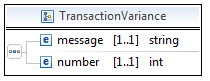








#### Common Operations Data Types

The following data types are defined in the *CommonOperations Definition section.* Elements using these types are referenced in *RPlan.xsd*. These data types provide access to data describing the Categories, Schedules and Entities.

The documentation regarding the common operation data types is presented in the following sections: first, a table containing written description for each data type and its children; second, diagrams to help the reader understand the composition and cardinality between data types.

##### Data Type Description in Tabular Format

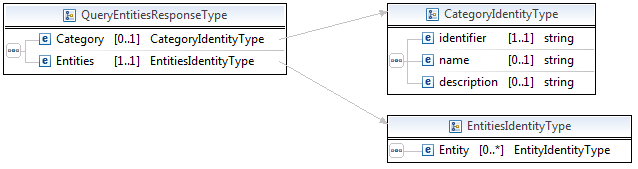
In the following table, the “Data Type” column provides the name of the data type, the “Children: Data Type” column specifies the children elements define contained within the parent, and the “Description” gives a brief description of the data type.

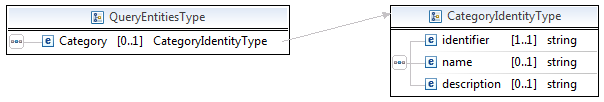
For example “identifier: string” specifies that the element name is “identifier” and it is a “string” data type and it is included in each instance of “CategoryIdentityType”.

| Data Type | Children: Data Type  *\*Indicates a required element* | Description |
| --- | --- | --- |
| QueryCategoriesResponseType | Categories: CategoriesIdentityType\* | The response data type that contains the collection Category elements.  See section 3.1.1.2 |
| QueryEntitiesResponseType | Category: CategoryIdentityType  Entities: EntitiesIdentityType\* | The response data type that contains the queried for Categories and Entities.  See section 3.1.1.2 |
| QueryEntitiesType | Category: CategoryIdentityType | Queries for Entities using a Category identifier as a filter.  See section 3.1.1.2 |
| QuerySchedulesResponseType | Schedules: SchedulesIdentityType\* | The response data type that contains the queried for Schedules.  See section 3.1.1.2 |

##### Data Type Relationships as Diagrams









## Handling Times

Within the XML schema, the data type shown in the table below represents date and time values. The lexical representation for this data types is specified by the ISO 8601 standard. The table shows the common notation, though the standard allows for flexibility in formats.

| Data Type | Lexical Representation | Example |
| --- | --- | --- |
| dateTime | YYYY-MM-DDThh:mm:ss(Z|(+|-)hh:mm); | 2011-02-01T11:00:00Z |

Note that the dateTime format includes the time zone indicator and the example shows time in Coordinated Universal Time (UTC). XML submissions to the ISO New England **e-terra***renewableplan* are required to specify a time zone indicator to avoid confusion during the daylight savings transition periods. Messages omitting the time zones will fail validation and be rejected.

Adding "-04:00" and “Z” to the end of dateTime representations will specify Eastern Standard Time and UTC, respectively. All samples in documentation will show timestamps that include the time zone. Any dateTime values without the time zone will be rejected and consequently return a Fault response.

All response messages containing date and time values will likewise use the dateTime format outlined above. Importantly, all dateTime values retrieved from a database will be presented with the UTC time zone (conforming exactly to how the value is stored in the database). Query filters (i.e., “TimeRange”) containing dateTime values will retain the original time zone in the response message.

# Forecaster Web Service

This section defines the endpoint operations available for Forecasters.

The table below shows a summary of the different messages and indicates if data can be submitted (read & write permissions) or queried (read only permission). The frequency for submitting and querying depends upon the message type; an explanation regarding these time intervals is documented in *ISO-NE Operating Procedure 14 – Appendix F.*

|  |  | Actions | |
| --- | --- | --- | --- |
| Message | Brief Description of Usage | Submit | Query |
| Categories | Retrieve a list of Categories. See section 3.1.1.3 |  | X |
| Schedules | Retrieve an authorized list of Schedules. See section 3.1.1.3 |  | X |
| Entities | Retrieve a list of authorized Entities; optionally filtered by a Category ‘identifier’. See section 3.1.1.3 |  | X |
| Forecast | Accommodates the requirement to query and submit most Forecasts types; includes the Schedule ‘identifier’, time range, and at least 1 Entity. See section 3.1.1.2. | X | X |
| Narrative | Contains a written narrative summarizing the conditions impacting forecasts. | X | X |
| Telemetry | Provides the ability to query for actual met data and power data. |  | X |
| Ramp Event | Provides the ability query and submit ramp event data for the system or for individual plants. | X | X |

## Categories

The Categories message provides the ability to query for Categories for which Entities are associated. As discussed in the section 3.1.1.3, the response contains information about the available Categories; of which ‘identifier’ values for can be applied as query filters for subsequent operations (i.e., QueryEntities, etc.).

### Query Message

#### Purpose of Message

The purpose of this message is to request the collection of all available Categories.

#### Mandatory and Optional Fields

To query for the Categories, the following empty XML element needs to be included in the request:

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | QueryCategories | QueryCategoriesType | The outermost element which contains an empty sequence. |

#### SOAP Format

Full SOAP Message

<soapenv:Envelope

xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"*

xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:QueryCategories/>

</soapenv:Body>

</soapenv:Envelope>

Sample of Query Submittal

<wint:QueryCategories/>

#### Data Returned

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | AuthorizationFault | Fault | An instance of the “FaultType” returned only when a fault occurs. See section 3.1.1.2.1 |
| No | No | QueryCategoriesResponse | QueryCategoriesResponseType | The outermost wrapper identifying the body as the response to the operation invoked. |
| No | No | Categories | CategoriesIdentityType | See section 3.1.1.3 |
| Yes | No | Category | CategoryIdentityType | See section 3.1.1.3 |

Full SOAP Format

<soap:Envelope xmlns:soap=*"http://schemas.xmlsoap.org/soap/envelope/"*>

<soap:Body>

<QueryCategoriesResponse  
 xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<Categories>

<!-- 0 or more repetitions -->

<Category>

<identifier>?</identifier>

<name>?</name>

<description>?</description>

</Category>

</Categories>

</QueryCategoriesResponse>

</soap:Body>

</soap:Envelope>

Sample of Query Response

<QueryCategoriesResponse>

<Categories>

<!-- 0 or more repetitions -->

<Category>

<identifier>WPLANT</identifier>

<name>WindPlant</name>

<description>  
 A logical grouping of Wind Plants  
 </description>

</Category>

</Categories>

</QueryCategoriesResponse>

## Schedules

The Schedules message provides the ability to query for Schedules for which the Forecaster is authorized. As discussed in the section 3.1.1.3, the response contains information about the available Schedules; of which ‘identifier’ values will be applied as query filters for subsequent operations (i.e., QueryForecast, etc.).

### Query Message

#### Purpose of Message

The purpose of this message is to request the collection of Schedules for which there is authorization to submit messages.

#### Mandatory and Optional Fields

To query for the Schedules the following empty XML element needs to be included in the request:

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | QuerySchedules | QuerySchedulesType | The outermost element which contains an empty sequence. |

#### SOAP Format

Full SOAP Message

<soapenv:Envelope  
 xmlns:soapenv=*"*[*http://schemas.xmlsoap.org/soap/envelope/*](http://schemas.xmlsoap.org/soap/envelope/)*"* xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:QuerySchedules/>

</soapenv:Body>

</soapenv:Envelope>

Sample of Query Submittal

<QuerySchedules/>

#### Data Returned

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | AuthorizationFault | Fault | An instance of the “FaultType” returned only when a fault occurs. See section 3.1.1.2.1 |
| No | No | QuerySchedulesResponse | QuerySchedulesResponseType | The outermost wrapper identifying the body as the response to the operation invoked. |
| No | No | Schedules | SchedulesIdentityType | See section 3.1.1.2 |
| Yes | No | Schedule | ScheduleIdentityType | See section 3.1.1.2 |

Full SOAP Format

<soap:Envelope  
 xmlns:soap=*"http://schemas.xmlsoap.org/soap/envelope/"*>

<soap:Body>

<QuerySchedulesResponse  
 xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<Schedules>

<!-- 0 or more repetitions -->

<Schedule>

<identifier>?</identifier>

<name>?</name>

<description>?</description>

<isReadOnly>?</isReadOnly>

</Schedule>

</Schedules>

</QuerySchedulesResponse>

</soap:Body>

</soap:Envelope>

Sample of Query Response

<QuerySchedulesResponse>

<Schedules>

<!-- 0 or more repetitions -->

<!-- Small sample of types represented below -->

<Schedule>

<identifier>10578005180101</identifier>

<name>STWPFCST\_5MIN-MW</name>

<description>

Short Term Wind Plant Forecast

with 5 minutes data granularity

Power Generation MW value.

</description>

<isReadOnly>false</isReadOnly>

</Schedule>

<Schedule>

<identifier> 10578005040123</identifier>

<name> TEXTFCST-NARRATIVE </name>

<description>  
 Narrative Forecast on weather conditions over the  
 timeframe of the medium-term forecast. A free-form  
 commentary text.  
 </description>

<isReadOnly>false</isReadOnly>

</Schedule>

<Schedule>

<identifier> 10578005110104 </identifier>

<name>TELEMETRY\_POWER-RTHOL</name>

<description>  
 Telemetry data related to wind plant power generation.  
 Real Time HIgh Operating Limit. The maximum MW output  
 taking into account plant availability.  
 </description>

<isReadOnly>true</isReadOnly>

</Schedule>

</Schedules>

</QuerySchedulesResponse>

## Entities

The Entities message provides the ability to query for Entities to which the Forecaster is authorized. As discussed in the section 3.1.1.3, the response contains information about the available Entities; of which ‘identifier’ values will be applied as query filters for subsequent operations (i.e., QueryForecast, etc.).

### Query Message

#### Purpose of Message

The purpose of this message is to request the collection of all accessible Entities.

#### Mandatory and Optional Fields

To query for the Entities the following data needs to be included in the request:

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | QueryEntities | QueryEntitiesType | The outermost element which contains the Category element. |
| Yes | No | Category | CategoryIdentityType | See section 3.1.1.2; contains the ‘identifier’ to apply as a filter to the Entity query. |

#### SOAP Format

Full SOAP Message

<soapenv:Envelope xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"* xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:QueryEntities>

<!-- Optional: -->

<wint:Category>

<wint:identifier>?</wint:identifier>

</wint:Category>

</wint:QueryEntities>

</soapenv:Body>

</soapenv:Envelope>

Sample of Query Submittal

<QueryEntities>

<Category>

<identifier>WPLANT</identifier>

</Category>

</QueryEntities>

#### Data Returned

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | AuthorizationFault | Fault | An instance of the “FaultType” returned only when a fault occurs. See section 3.1.1.2.1 |
| No | No | QueryEntitiesResponse | QueryEntitiesResponseType | The outermost wrapper identifying the body as the response to the operation invoked.  See section 3.1.1.3 |
| No | No | Entities | EntitiesIdentityType | See section 3.1.1.2 |
| Yes | No | Entity | EntityIdentityType | See section 3.1.1.2 |
| Yes | No | Category | CategoryIdentityType | See section 3.1.1.2 |

Full SOAP Format

<soap:Envelope  
 xmlns:soap=*"http://schemas.xmlsoap.org/soap/envelope/"*>

<soap:Body>

<QueryEntitiesResponse  
 xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<!-- 0 or 1 repetitions -->

<Category>

<identifier>WPLANT</identifier>

</Category>

<Entities>

<!-- 0 or more repetitions -->

<Entity>

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier> <name>BRKW</name>

<description>BRKW</description>

<isReadOnly>false</isReadOnly>

</Entity>

</Entities>

</QueryEntitiesResponse>

</soap:Body>

</soap:Envelope>

Sample of Query Response

<QueryEntitiesResponse>

<!-- 0 or 1 repetitions -->

<Category>

<identifier>WPLANT</identifier>

</Category>

<Entities>

<!-- 0 or more repetitions -->

<Entity>

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier>

<name>BRKW</name>

<description>BRKW</description>

<isReadOnly>false</isReadOnly>

</Entity>

</Entities>

</QueryEntitiesResponse>

## Forecast

The Forecast message provides the ability to query and submit forecasts. Forecasters accessing this endpoint will only have access to the following forecasts:

Submit and Query Operations

* Short Term Wind and Solar Plant Forecast
* Medium Term Wind and Solar Plant Forecast
* Long Term Wind and Solar Plant Forecast
* Probabilistic Forecast

Query Operations

* Wind and Solar Plant Future Availability (WPFA/SPFA)

Each item in the list above corresponds to a unique Schedule in the **e-terra***renewableplan* system – a listing of which is retrieved using the QuerySchedules operation (see section 4.2). By using the Schedule “identifier” contained within the response from the QuerySchedules operation, forecasts can be queried and submitted.

### Query Message

#### Purpose of Message

The purpose of this message is to query for submitted forecast data. As mentioned in sections 4.1, 4.2, and 4.3, each forecast query should contain valid Category (optional), Schedule, and Entity identifiers.

#### Mandatory and Optional Fields

To query for the Schedules the following data needs to be included in the request:

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | QueryForecast | ScheduleRequestType | The outermost element which contains the ScheduleRequest element. |
| No | No | ScheduleRequest | BaseRequestType | See section 3.1.1.2 |
| Yes | No | TimeRange | DateRangeType | See section 3.1.1.2  Response is filtered by the provided time range. |
| Yes | No | Category | CategoryIdentityType | As a convenience, if the query contains a Category and zero Entity elements, the response will contain all Entity elements associated with the Category.  See section 3.1.1.2 |
| No | No | Entities | EntitiesIdentityType | See section 3.1.1.2 |
| Yes | No | Entity | EntityIdentityType | If an Entity is included in the query, including the Category is unnecessary.  See section 3.1.1.2 |
| No | No | Schedule | ScheduleIdentityType | See section 3.1.1.2 |

#### SOAP Format

Full SOAP Message

<soapenv:Envelope

xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"* xmlns:wint=*"wint:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:QueryForecast>

<!-- 1 or more repetitions: -->

<wint:ScheduleRequest>

<wint:Schedule>

<wint:identifier>?</wint:identifier>

</wint:Schedule>

<!-- Optional: -->

<wint:TimeRange>

<wint:fromTime>?</wint:fromTime>

<wint:toTime>?</wint:toTime>

</wint:TimeRange>

<wint:Entities>

<!-- 0 or more repetitions: -->

<!-- **Option 1**: list of at least 1 Entity and   
 no Category. Entity can be specified by

Identifier, assetIdentifier, or both-->

<wint:Entity>

<wint:identifier>?</wint:identifier>

<wint:assetIdentifier>?</wint:assetIdentifier>

</wint:Entity>

</wint:Entities>

<!-- Optional: -->

<!-- **Option 2**: all Entities associated with this

Category will be included in the response if no

entities are provided -->  
 <wint:Category>

<wint:identifier>?</wint:identifier>

</wint:Category>

</wint:ScheduleRequest>

</wint:QueryForecast>

</soapenv:Body>

</soapenv:Envelope>

Sample of Query Submittal

<QueryForecast>

<!-- 1 or more repetitions: -->

<ScheduleRequest>

<Schedule>

<identifier>9905001</identifier>

</Schedule>

<!-- Optional: -->

<TimeRange>

<fromTime>2012-09-05T15:25:00Z</fromTime>

<toTime>2012-09-05T19:20:01Z</toTime>

</TimeRange>

<Entities>

<!-- 0 or more repetitions: -->

<Entity>

<!-- 1 or both identifiers -->

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier>

</Entity>

</Entities>

</ScheduleRequest>

</QueryForecast>

#### Data Returned

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | ForecastFault | Fault | An instance of the “FaultType” returned only when a fault occurs. See section 3.1.1.2.1 |
| No | No | QueryForecastResponse | PowerScheduleResponseType | The outermost wrapper identifying the body as the response to the operation invoked.  See section 3.1.1.3 |
| No | No | ScheduleResponse | PowerScheduleDataType | Wrapper for the query response results. |
| Yes | No | Category | CategoryIdentityType | See section 3.1.1.2 |
| No | No | Schedule | ScheduleIdentityType | See section 3.1.1.2 |
| Yes | No | TimeRange | DateRangeType | See section 3.1.1.2; Response is filtered by the provided time range. |
| Yes | No | TimeInterval | long | For informational purposes, provides the interval, in seconds, applying to all “time” elements in the subsequent time-series data.  For example:   * 300 = 5 minutes * 3600 = 1 hour * 10080 = 3 days |
| No | No | Entities | PowerEntitiesIdentityType | Contains Entity elements that have “Power” related time-series data children. |
| Yes | No | Entity | PowerEntityIdentityType | Extends EntityIdentityType by adding to that definition series of unbounded “Power” elements as children (PowerEntityIdentityType)  See (see section 3.1.1.2) |
| Yes | No | Power | TimeValueSeriesType | Wrapper element for time-series power data.  See section 3.1.1.2 |
| No | No | time | dateTime | See section 3.1.1.2 |
| No | No | value | decimal | Value is in MW  See section 3.1.1.2 |

Full SOAP Format

<soap:Envelope  
 xmlns:soap=*"http://schemas.xmlsoap.org/soap/envelope/"*>

<soap:Body>

<QueryForecastResponse  
 xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<ScheduleResponse>

<Schedule>

<identifier>?</identifier>

<name>?</name>

</Schedule>

<TimeRange>

<fromTime>?</fromTime>

<toTime>?</toTime>

</TimeRange>

<TimeInterval>?</TimeInterval>

<Entities>

<Entity>

<!-- 1 or both identifiers -->

<identifier>?</identifier>

<assetIdentifier>?</assetIdentifier>

<name>?</name>

<Power>

<time>?</time>

<value>?</value>

</Power>

</Entity>

</Entities>

</ScheduleResponse>

</QueryForecastResponse>

</soap:Body>

</soap:Envelope>

Sample of Query Response

<QueryForecastResponse>

<!-- Example: a short term wind plant forecast -->

<ScheduleResponse>

<Schedule>

<identifier>9905001</identifier>

<!-- **‘**name’ included for informational purposes -->

<name>STWPFCST\_5MIN</name>

</Schedule>

<TimeRange>

<fromTime>2012-09-05T15:25:00Z</fromTime>

<toTime>2012-09-05T19:20:01Z</toTime>

</TimeRange>

<!-- Time-series data in 5-minute intervals -->

<TimeInterval>300</TimeInterval>

<Entities>

<Entity>

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier> <!-- **‘**name’ included for informational purposes -->

<name>BRKW</name>

<!-- 0 or more repetitions: -->

<Power>

<time>2012-09-05T15:25:00Z</time>

<value>1</value>

</Power>

</Entity>

</Entities>

</ScheduleResponse>

</QueryForecastResponse>

### Submit Message

#### Purpose of Message

The purpose of this message is to create a forecast. As mentioned in sections 4.1, 4.2, and 4.3, each forecast submission should contain valid Category (optional), Schedule, and Entity identifiers.

#### Mandatory and Optional Fields

To create a forecast, the following needs to be provided:

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | SubmitForecast | CreatePowerScheduleType | The outermost wrapper identifying the body as the forecast submission. |
| No | No | CreateSchedule | PowerScheduleDataType | Wrapper for the forecast submission. |
| No | No | Schedule | ScheduleIdentityType | See section 3.1.1.2 |
| Yes | No | TimeRange | DateRangeType | See section 3.1.1.2; |
| No | No | Entities | PowerEntitiesIdentityType | Contains Entity elements that have “Power” related time-series data children. |
| Yes | No | Entity | PowerEntityIdentityType | Extends EntityIdentityType by adding to that definition “Power” element children (PowerEntityIdentityType)  See (see section 3.1.1.2) |
| Yes | No | Power | TimeValueSeriesType | Container element for time-series power data.  See section 3.1.1.2 |

#### SOAP Format

Full SOAP Format

<soapenv:Envelope

xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"*

xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:SubmitForecast>

<!-- 1 or more repetitions: -->

<wint:CreateSchedule>

<!-- 1 or more repetitions: -->

<wint:Schedule>

<wint:identifier>9905001</wint:identifier>

</wint:Schedule>

<!-- Optional: -->

<wint:TimeRange>

<wint:fromTime>2012-09-05T15:25:00Z</wint:fromTime>

<wint:toTime>2012-09-05T19:20:01Z</wint:toTime>

</wint:TimeRange>

<wint:Entities>

<!-- 0 or more repetitions: -->

<wint:Entity>

<!-- 1 or both identifiers -->

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier>

<!-- 0 or more repetitions: -->

<Power>

<time>2012-09-05T15:25:00Z</time>

<value>1</value>

</Power>

</wint:Entity>

</wint:Entities>

</wint:CreateSchedule>

</wint:SubmitForecast>

</soapenv:Body>

</soapenv:Envelope>

Sample of a Submittal

<SubmitForecast>

<!-- 1 or more repetitions: -->

<CreateSchedule>

<!-- 1 or more repetitions: -->

<Schedule>

<identifier>9905001</identifier>

</Schedule>

<!-- Optional: -->

<TimeRange>

<fromTime>2012-09-05T15:25:00Z</fromTime>

<toTime>2012-09-05T19:20:01Z</toTime>

</TimeRange>

<Entities>

<!-- 0 or more repetitions: -->

<Entity>

<!-- 1 or both identifiers -->

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier>

<!-- 0 or more repetitions: -->

<Power>

<time>2012-09-05T15:25:00Z</time>

<value>1</value>

</Power>

</Entity>

</Entities>

</CreateSchedule>

</SubmitForecast>

Response Message

This message has a standard response as defined in section 2.1.

## Narrative

The Narrative message provides the ability to query and submit Narrative Forecasts. Narratives are submitted at least once ‘daily’ and include a written summary describing the current and forecasted weather conditions.

### Query Message

#### Purpose of Message

The purpose of this message is to query for submitted narratives.

#### Mandatory and Optional Fields

To query for the Narratives, the following data needs to be included in the request:

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | QueryNarrative | QueryNarrativeType | The outermost element which contains the query elements. |
| Yes | No | TimeRange | DateRangeType | See section 3.1.1.2  Provides the ability to filter the query by a given time range. (We do not expect this to be used in the ISONE RPLAN project). |
| No | No | Entity | EntityIdentityType | The entity identifier should always be for the SYSTEM Entity.  See section 3.1.1.2 |

#### SOAP Format

Full SOAP Message

<soapenv:Envelope

xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"*

xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:QueryNarrative>

<!-- Optional: provide a time range filter -->

<wint:TimeRange>

<wint:fromTime>?</wint:fromTime>

<wint:toTime>?</wint:toTime>

</wint:TimeRange>

<wint:Entity>

<wint:identifier>?</wint:identifier>

</wint:Entity>

</wint:QueryNarrative>

</soapenv:Body>

</soapenv:Envelope>

Sample of Query Submittal

<QueryNarrative>

<TimeRange>

<fromTime>2012-05-15T06:23:42Z</fromTime>

<toTime>2012-05-17T06:23:42Z</toTime>

</TimeRange>

<Entity>

<identifier>10240</identifier>

</Entity>

</QueryNarrative>

#### Data Returned

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | NarrativeFault | Fault | An instance of the “FaultType” returned only when a fault occurs. See section 3.1.1.2.1 |
| No | No | QueryNarrativeResponse | QueryNarrativeResponseType | The outermost wrapper identifying the body as the response to the operation invoked.  See section 3.1.1.3 |
| Yes | No | TimeRange | DateRangeType | See section 3.1.1.2; Response is filtered by the provided time range. |
| Yes | No | Entity | EntityIdentityType | Identifies the System Entity.  See (see section 3.1.1.2) |
| Yes | No | Narrative | NarrativeType | Container for the narrative information. |
| No | No | [Narrative] SubmissionTime | dateTime | Contains the time the Narrative was received by the web service. |
| No | No | [Narrative] Summary | string | Contains the written Narrative information. |

Full SOAP Format

<soap:Envelope  
 xmlns:soap=*"http://schemas.xmlsoap.org/soap/envelope/"*>

<soap:Body>

<QueryNarrativeResponse  
 xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<Entity>

<identifier>?</identifier>

<name>?</name>

</Entity>

<Narrative>

<SubmissionTime>?</SubmissionTime>

<Summary>?</Summary>

</Narrative>

</QueryNarrativeResponse>

</soap:Body>

</soap:Envelope>

Sample of Query Response

<QueryNarrativeResponse  
 xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<Entity>

<identifier>10240</identifier>

<name>ISONE</name>

</Entity>

<Narrative>

<SubmissionTime>2012-05-16T13:45:29Z</SubmissionTime>

<Summary>Sunny with winds from the west at 10 MPH.</Summary>

</Narrative>

</QueryNarrativeResponse>

### Submit Message

#### Purpose of Message

The purpose of this message is to create narrative.

#### Mandatory and Optional Fields

To create a narrative, the following needs to be provided:

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | SubmitNarrative | SubmitNarrativeType | The outermost wrapper identifying the body as the narrative submission. |
| Yes | No | Entity | EntityIdentityType | Optional Entity representing an Area. The default is SYSTEM.  See section 3.1.1.2 |
| No | No | Summary | string | Contains the written Narrative information. |

#### SOAP Format

Full SOAP Format

<soapenv:Envelope

xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"*

xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:SubmitNarrative>

<!-- 0 or more repetitions: -->

<wint:Entity>

<wint:identifier>?</wint:identifier>

</wint:Entity>

<wint:Summary>?</wint:Summary>

</wint:SubmitNarrative>

</soapenv:Body>

</soapenv:Envelope>

Sample of a Submittal

<wint:SubmitNarrative>

<wint:Summary>

Increasing wind over the next hour.

</wint:Summary>

</wint:SubmitNarrative>

Response Message

This message has a standard response as defined in section 2.1.

## Telemetry

The Telemetry message provides the ability to query for the actual telemetered values and includes support to retrieve both meteorological (‘met’) and power measurement data. By including the Schedule identifiers for each telemetry type and associating each to an Entity, all supported measurements types, as defined in the requirements, can be queried.

### Query Message

#### Purpose of Message

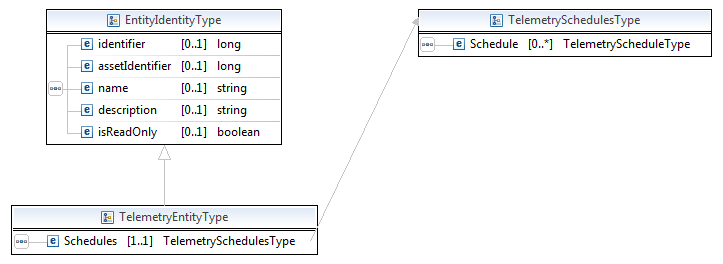
The purpose of this message is to query for telemetry data.

#### Mandatory and Optional Fields

To query for the telemetered data the following needs to be included in the request:

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | QueryTelemetry | TelemetryRequestType | The outermost element which contains the TelemetryRequest element. |
| No | No | TelemetryRequest | TelemetryType | Provides the ability to filter the query by a given type of telemetry |
| Yes | No | TimeRange | DateRangeType | See section 3.1.1.2  Provides the ability to filter the query by a given time range |
| No | No | Entities | TelemetryEntitiesType | Parent element for a series of Entity elements containing telemetry time-series data points. |
| No | No | Entity | TelemetryEntityType | Extends EntityIdentityType by adding to that definition a “Schedules” element.  See (see section 3.1.1.2) |
| No | No | Schedules | TelemetrySchedulesType | Parent element containing multiple schedules – which makes it possible to associate multiple schedules with an entity |
| Yes | No | Schedule | TelemetryScheduleType | Associates a Schedule with the Entity |

Note, unlike all previous messages (i.e., Forecast, Narrative, etc.) where there is a one-to-many relationship between Schedule and Entity, Telemetry messages a have a one-to-many relationship between Entity and Schedules. To retrieve power telemetry values for a single Entity, the request must associate multiple Schedules to each Entity. The diagram below illustrates how TelemetryEntityType extends the EntityIdentityType by adding Schedules as a child:



#### SOAP Format

Full SOAP Message

<soapenv:Envelope

xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"*

xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:QueryTelemetry>

<!-- 1 or more repetitions: -->

<wint:TelemetryRequest>

<wint:TimeRange>

<wint:fromTime>?</wint:fromTime>

<wint:toTime>?</wint:toTime>

</wint:TimeRange>

<wint:Entities>

<!-- 1 or more repetitions: -->

<wint:Entity>

<wint:identifier>?</wint:identifier>

<wint:assetIdentifier>?</wint:assetIdentifier>

<wint:Schedules>

<!-- 0 or more repetitions: -->

<wint:Schedule>

<wint:identifier>?</wint:identifier>

</wint:Schedule>

</wint:Schedules>

</wint:Entity>

</wint:Entities>

</wint:TelemetryRequest>

</wint:QueryTelemetry>

</soapenv:Body>

</soapenv:Envelope>

Sample of Query Submittal

<QueryTelemetry>

<!-- 1 or more repetitions: -->

<TelemetryRequest>

<TimeRange>

<fromTime>2012-05-31T00:00:00Z</fromTime>

<toTime>2012-06-02T00:00:00Z</toTime>

</TimeRange>

<Entities>

<!-- 1 or more repetitions: -->

<Entity>

<!-- 1 or both identifiers -->

<!-- Example: wind plant BRKW -->

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier>

<Schedules>

<!-- 0 or more repetitions: -->

<Schedule>

<!-- Example: TELEMETRY\_POWER-RTHOL -->

<identifier>9905015</identifier>

</Schedule>

</Schedules>

</Entity>

</Entities>

</TelemetryRequest>

</QueryTelemetry>

#### Data Returned

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | TelemetryFault | Fault | An instance of the “FaultType” returned only when a fault occurs. See section 3.1.1.2.1 |
| No | No | QueryTelemetryResponse | TelemetryResponseType | The outermost element which contains the TelemetryResponse element. |
| No | No | TelemetryResponse | TelemetryType | Provides the ability to filter the query by a given type of telemetry |
| Yes | No | TimeRange | DateRangeType | Provides the ability to filter the query by a given time range |
| No | No | Entities | TelemetryEntitiesType | Parent element for a series of Entity elements containing telemetry time-series data points. |
| No | No | Entity | TelemetryEntityType | Extends EntityIdentityType by adding to that definition a “Schedules” element.  See section 3.1.1.2 |
| No | No | Schedules | TelemetrySchedulesType | Parent element containing multiple schedules – which makes it possible to associate multiple schedules with an entity |
| Yes | No | Schedule | TelemetryScheduleType | Associates a Schedule with the Entity |
| Yes | No | Actual | TelemetrySchedulePointType | Parent element for telemetered time-value series data. |
| No | No | time | dateTime | See section 3.1.1.2 |
| No | No | value | decimal | Actual measurement data; Power uses MW; Met Measurements units vary depending on Schedule type.  See section 3.1.1.2 |
| Yes | No | quality | string | An assessment of the overall quality of the measurement. This value is not evaluated by the application; the value is derived from SCADA. |

Full SOAP Format

<soap:Envelope  
 xmlns:soap=*"http://schemas.xmlsoap.org/soap/envelope/"*>

<soap:Body>

<QueryTelemetryResponse  
 xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<!-- 1 or more repetitions: -->

<TelemetryResponse>

<TimeRange>

<fromTime>?</fromTime>

<toTime>?</toTime>

</TimeRange>

<Entities>

<!-- 1 or more repetitions: -->

<Entity>

<identifier>?</identifier>

<assetIdentifier>?</assetIdentifier>

<name>?</name>

<Schedules>

<!-- 0 or more repetitions: -->

<Schedule>

<identifier>?</identifier>

<name>?</name>

<!-- 0 or more repetitions: -->

<Actual>

<time>?</time>

<value>?</value>

<quality>?</quality>

</Actual>

</Schedule>

</Schedules>

</Entity>

</Entities>

</TelemetryResponse>

</QueryTelemetryResponse>

</soap:Body>

</soap:Envelope>

Sample of Query Response

<soap:Envelope  
 xmlns:soap=*"http://schemas.xmlsoap.org/soap/envelope/"*>

<soap:Body>

<QueryTelemetryResponse  
 xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<!-- 1 or more repetitions: -->

<TelemetryResponse>

<TimeRange>

<fromTime>2012-05-31T00:00:00Z</fromTime>

<toTime>2012-06-02T00:00:00Z</toTime>

</TimeRange>

<Entities>

<!-- 1 or more repetitions: -->

<Entity>

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier> <name>BRKW</name>

<Schedules>

<!-- 0 or more repetitions: -->

<Schedule>

<identifier>9905015</identifier>

<name>TELEMETRY\_POWER-RTHOL</name>

<!-- 0 or more repetitions: -->

<Actual>

<time>2012-06-01T01:11:14Z</time>

<value>15</value>

<quality>GOOD</quality>

</Actual>

</Schedule>

</Schedules>

</Entity>

</Entities>

</TelemetryResponse>

</QueryTelemetryResponse>

</soap:Body>

</soap:Envelope>

## Ramp Event

The ramp event message provides the ability to query and submit Ramp Event data. Ramp events contain probability data related to start and end time of the event as well as the magnitude of the power generation. For each of these, probabilities are expressed in terms of “high”, “medium”, and “low”.

### Query Message

#### Purpose of Message

The purpose of this message is to query for submitted ramp events.

#### Mandatory and Optional Fields

Following the same pattern, to query for the ramp events the following data needs to be included in the request:

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | QueryRampEvent | ScheduleRequestType | The outermost element which contains the ScheduleRequest element. |
| No | No | ScheduleRequest | BaseRequestType | See section 3.1.1.2 |
| Yes | No | TimeRange | DateRangeType | See section 3.1.1.2  Provides the ability to filter the query by a given time range |
| Yes | No | Category | CategoryIdentityType | As a convenience, if the query contains a Category and zero Entity elements, the response will contain all Entity associated with the Category.  See section 3.1.1.2 |
| No | No | Entities | EntitiesIdentityType | See section 3.1.1.2 |
| Yes | No | Entity | EntityIdentityType | If an Entity is included in the query, including the Category is unnecessary.  See section 3.1.1.2 |
| No | No | Schedule | ScheduleIdentityType | See section 3.1.1.2 |

#### SOAP Format

Full SOAP Message

<soapenv:Envelope

xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"*

xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:QueryRampEvent>

<!-- 1 or more repetitions: -->

<wint:ScheduleRequest>

<wint:Schedule>

<wint:identifier>?</wint:identifier>

</wint:Schedule>

<!-- Optional: -->

<wint:TimeRange>

<wint:fromTime>?</wint:fromTime>

<wint:toTime>?</wint:toTime>

</wint:TimeRange>

<wint:Entities>

<!-- 0 or more repetitions: -->

<wint:Entity>

<wint:identifier>?</wint:identifier>

<wint:assetIdentifier>?</wint:assetIdentifier>

</wint:Entity>

</wint:Entities>

</wint:ScheduleRequest>

</wint:QueryRampEvent>

</soapenv:Body>

</soapenv:Envelope>

Sample of Query Submittal

<QueryRampEvent>

<!-- 1 or more repetitions: -->

<ScheduleRequest>

<Schedule>

<identifier>9905005</identifier>

</Schedule>

<!-- Optional: -->

<TimeRange>

<fromTime>2012-09-06T17:07:27Z</fromTime>

<toTime>2012-09-07T03:07:27Z</toTime>

</TimeRange>

<Entities>

<!-- 0 or more repetitions: -->

<Entity>

<!-- 1 or both identifiers -->

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier>

</Entity>

</Entities>

</ScheduleRequest>

</QueryRampEvent>

#### Data Returned

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | RampEventFault | Fault | An instance of the “FaultType” returned only when a fault occurs. See section 3.1.1.2.1 |
| No | No | QueryRampEventResponse | RampEventScheduleResponseType | The outermost wrapper identifying the body as the response to the operation invoked. |
| No | No | ScheduleResponse | PowerScheduleDataType | Wrapper for the query response results. |
| No | No | Schedule | ScheduleIdentityType | See section 3.1.1.2 |
| Yes | No | TimeRange | DateRangeType | See section 3.1.1.2; Response is filtered by the provided time range. |
| No | No | Entities | RampEventEntitiesIdentityType | Container for Entity elements which have “Ramp Event” probability-related data children. |
| Yes | No | Entity | RampEventEntityIdentityType | Extends EntityIdentityType by adding to that definition series of unbounded “Power” elements as children (PowerEntityIdentityType)  See (see section 3.1.1.2) |
| No | No | StartTimeProbability | TimeProbabilityType | Container element for the high, low, and medium probabilities related to the beginning time of the ramp event occurrence. |
| No | No | EndTimeProbability | TimeProbabilityType | Container element for the high, low, and medium probabilities related to the ending time of the ramp event occurrence. |
| No | No | MagnitudeProbability | PowerProbabilityType | Container element for the high, low, and medium probabilities related to the magnitude of power generation (in MW). |
| No | No | high  [TimeProbabilityType] | dateTime | First of 3 elements defined within the “TimeProbabilityType” complex type. There is a high probability (e.g. 90%) that a Ramp Event will start before this time. |
| No | No | medium [TimeProbabilityType] | dateTime | Second of 3 elements defined within the “TimeProbabilityType” complex type. There is a medium probability (e.g. 50%) that a Ramp Event will start before this time. |
| No | No | low  [TimeProbabilityType] | dateTime | Third of 3 elements defined within the “TimeProbabilityType” complex type. There is a low probability (e.g. 10%) that a Ramp Event will start before this time. |
| No | No | high  [PowerProbabilityType] | decimal | First of 3 elements defined within the “PowerProbabilityType” complex type. There is a high probability (e.g. 90%) that a Ramp Event MW power generation will be at least this value or greater. |
| No | No | medium [PowerProbabilityType] | decimal | Second of 3 elements defined within the “PowerProbabilityType” complex type. There is a medium probability (e.g. 50%) that a Ramp Event MW power generation will be at least this value or greater. |
| No | No | low  [PowerProbabilityType] | decimal | Third of 3 elements defined within the “PowerProbabilityType” complex type. There is a low probability (e.g. 10%) that a Ramp Event MW power generation will be at least this value or greater. |

Full SOAP Format­­

<soap:Envelope

xmlns:soap=*"http://schemas.xmlsoap.org/soap/envelope/"*>

<soap:Body>

<QueryRampEventResponse

xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<ScheduleResponse>

<Schedule>

<identifier>?</identifier>

<name>?</name>

</Schedule>

<TimeRange>

<fromTime>?</fromTime>

<toTime>?</toTime>

</TimeRange>

<Entities>

<Entity>

<identifier>?</identifier>

<assetIdentifier>?</assetIdentifier>

<name>?</name>

<StartTimeProbability>

<high>?</high>

<medium>?</medium>

<low>?</low>

</StartTimeProbability>

<EndTimeProbability>

<high>?</high>

<medium>?</medium>

<low>?</low>

</EndTimeProbability>

<MagnitudeProbability>

<high>?</high>

<medium>?</medium>

<low>?</low>

</MagnitudeProbability>

</Entity>

</Entities>

</ScheduleResponse>

</QueryRampEventResponse>

</soap:Body>

</soap:Envelope>

Sample of Query Response

<QueryRampEventResponse>

<ScheduleResponse>

<Schedule>

<identifier>10578005050124</identifier>

<!-- **‘**name’ included for informational purposes -->

<name> WPEVENTFCST-RAMPEVENT </name>

</Schedule>

<TimeRange>

<fromTime>2012-09-06T17:07:27Z</fromTime>

<toTime>2012-09-07T03:07:27Z</toTime>

</TimeRange>

<Entities>

<Entity>

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier> <!-- **‘**name’ included for informational purposes -->

<name>BRKW</name>

<StartTimeProbability>

<high>2012-09-06T21:07:27Z</high>

<medium>2012-09-06T20:07:27Z</medium>

<low>2012-09-06T19:07:27Z</low>

</StartTimeProbability>

<EndTimeProbability>

<high>2012-09-07T00:07:27Z</high>

<medium>2012-09-06T23:07:27Z</medium>

<low>2012-09-06T22:07:27Z</low>

</EndTimeProbability>

<MagnitudeProbability>

<high>10.0</high>

<medium>12.5</medium>

<low>15.0</low>

</MagnitudeProbability>

</Entity>

</Entities>

</ScheduleResponse>

</QueryRampEventResponse>

### Submit Message

#### Purpose of Message

The purpose of this message is to create a Ramp Event. Forecasters can create one or more Ramp Events for the same entity or multiple entities (i.e., a “Wind Plant”, “System”, etc.) within the same submittal message. In addition, newly submitted Ramp Events replace all previous ramp events for a given entity. Users requesting Ramp Event data will only see the most recently submitted ramp event per entity.

#### Mandatory and Optional Fields

To create a Ramp Event, the following needs to be provided (note that most of the elements are also described in section 4.7.1.2 above):

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | SubmitRampEvent | CreateRampEventScheduleType | The outermost wrapper identifying the body as the ramp event submission. |
| No | No | CreateRampEvent | RampEventScheduleDataType | Wrapper for the ramp event submission. |
| No | No | Schedule | ScheduleIdentityType | See section 3.1.1.2 |
| Yes | No | TimeRange | DateRangeType | See section 3.1.1.2; |
| No | No | Entities | RampEventEntitiesIdentityType | Container for Entity elements which have “Ramp Event” probability-related data children. |
| Yes | No | Entity | RampEventEntityIdentityType | Extends EntityIdentityType by adding to that definition series of unbounded “Power” elements as children (PowerEntityIdentityType)  See (see section 3.1.1.2) |
| Yes | No | StartTimeProbability | TimeProbabilityType | Container element for the high, low, and medium probabilities related to the beginning time of the ramp event occurrence. |
| Yes | No | EndTimeProbability | TimeProbabilityType | Container element for the high, low, and medium probabilities related to the ending time of the ramp event occurrence. |
| Yes | No | MagnitudeProbability | PowerProbabilityType | Container element for the high, low, and medium probabilities related to the magnitude of power generation (in MW). |
| No | No | high  [TimeProbabilityType] | dateTime | First of 3 elements defined within the “TimeProbabilityType” complex type. There is a high probability (e.g. 90%) that a Ramp Event will start before this time. |
| No | No | medium [TimeProbabilityType] | dateTime | Second of 3 elements defined within the “TimeProbabilityType” complex type. There is a medium probability (e.g. 50%) that a Ramp Event will start before this time. |
| No | No | low  [TimeProbabilityType] | dateTime | Third of 3 elements defined within the “TimeProbabilityType” complex type. There is a low probability (e.g. 10%) that a Ramp Event will start before this time. |
| No | No | high  [PowerProbabilityType] | decimal | First of 3 elements defined within the “PowerProbabilityType” complex type. There is a high probability (e.g. 90%) that a Ramp Event MW power generation will be at least this value or greater. |
| No | No | medium [PowerProbabilityType] | decimal | Second of 3 elements defined within the “PowerProbabilityType” complex type. There is a medium probability (e.g. 50%) that a Ramp Event MW power generation will be at least this value or greater. |
| No | No | low  [PowerProbabilityType] | decimal | Third of 3 elements defined within the “PowerProbabilityType” complex type. There is a low probability (e.g. 10%) that a Ramp Event MW power generation will be at least this value or greater. |

#### SOAP Format

Full SOAP Format

<soapenv:Envelope

xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"*

xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:SubmitRampEvent>

<wint:CreateRampEvent>

<wint:Schedule>

<wint:identifier>?</wint:identifier>

</wint:Schedule>

<wint:Entities>

<wint:Entity>

<wint:identifier>?</wint:identifier>

<wint:assetIdentifier>?</wint:assetIdentifier>

<wint:StartTimeProbability>

<wint:high>?</wint:high>

<wint:medium>?</wint:medium>

<wint:low>?</wint:low>

</wint:StartTimeProbability>

<wint:EndTimeProbability>

<wint:high>?</wint:high>

<wint:medium>?</wint:medium>

<wint:low>?</wint:low>

</wint:EndTimeProbability>

<wint:MagnitudeProbability>

<wint:high>?</wint:high>

<wint:medium>?</wint:medium>

<wint:low>?</wint:low>

</wint:MagnitudeProbability>

</wint:Entity>

</wint:Entities>

</wint:CreateRampEvent>

</wint:SubmitRampEvent>

</soapenv:Body>

</soapenv:Envelope>

Sample of a Submittal

<SubmitRampEvent>

<CreateRampEvent>

<Schedule>

<identifier>9905005</identifier>

</Schedule>

<Entities>

<Entity>

<!-- 1 or both identifiers -->

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier>

<StartTimeProbability>

<high>2012-09-06T21:07:27Z</high>

<medium>2012-09-06T20:07:27Z</medium>

<low>2012-09-06T19:07:27Z</low>

</StartTimeProbability>

<EndTimeProbability>

<high>2012-09-07T00:07:27Z</high>

<medium>2012-09-06T23:07:27Z</medium>

<low>2012-09-06T22:07:27Z</low>

</EndTimeProbability>

<MagnitudeProbability>

<high>10.00</high>

<medium>12.50</medium>

<low>15.00</low>

</MagnitudeProbability>

</Entity>

</Entities>

</CreateRampEvent>

</SubmitRampEvent>

**Note:** Forecasters are able to "cancel" one or more Ramp Events by sending a submission with only the Schedule identifier and the Entity identifier/s (see below). In the following example, the most recent Ramp Event for the System entity is effectively “canceled”.

Sample of a Cancel Submittal

<SubmitRampEvent>

<CreateRampEvent>

<Schedule>

<identifier>9905005</identifier>

</Schedule>

<Entities>

<Entity>

<!-- 1 or both identifiers -->

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier>

</Entity>

</Entities>

</CreateRampEvent>

</SubmitRampEvent>

Response Message

This message has a standard response as defined in section 2.1.

# Lead Participant Web Service

This section defines the endpoint operations available to Lead Participants. This service differs only from the Forecaster Web Service (section 4.0) in that the Plant Operator Service does not provide Forecast submittal (except for plant Future Availability forecast), Narrative, Telemetry, and Ramp Event operations.

The table below shows a summary of the different messages and indicates if data can be submitted (read & write permissions) or queried (read only permission). The frequency for submitting and querying depends upon the message type; an explanation regarding these time intervals is outside the scope of this document. For more information please consult the *“Wind Integration – Phase 1 Delta Design Note” and “RPLAN Solar DDN”* documentation.

|  |  | Actions | |
| --- | --- | --- | --- |
| Message | Brief Description of Usage | Submit | Query |
| Categories | Retrieve a list of Categories. See section 3.1.1.3 |  | X |
| Schedules | Retrieve an authorized list of Schedules. See section 3.1.1.3 |  | X |
| Entities | Retrieve a list of authorized Entities; optionally filtered by a Category ‘identifier’. See section 3.1.1.3 |  | X |
| Forecast | Accommodates the requirement to query Plant generation forecasts and submit and query WPFA/SPFA as a forecast schedule type; includes the Schedule ‘identifier’, time range, and at least 1 Entity. See section 3.1.1.2. | X | X |

## Categories

The Categories message provides the ability to query for Categories for which Entities are associated. As discussed in the section 3.1.1.3, the response contains information about the available Categories; of which ‘identifier’ values for can be applied as query filters for subsequent operations (i.e., QueryEntities, etc.).

### Query Message

#### Purpose of Message

The purpose of this message is to request the collection of all available Categories.

#### Mandatory and Optional Fields

To query for the Categories, the following empty XML element needs to be included in the request:

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | QueryCategories | QueryCategoriesType | The outermost element which contains an empty sequence. |

#### SOAP Format

Full SOAP Message

<soapenv:Envelope

xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"*

xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:QueryCategories/>

</soapenv:Body>

</soapenv:Envelope>

Sample of Query Submittal

<wint:QueryCategories/>

#### Data Returned

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | AuthorizationFault | Fault | An instance of the “FaultType” returned only when a fault occurs. See section 3.1.1.2.1 |
| No | No | QueryCategoriesResponse | QueryCategoriesResponseType | The outermost wrapper identifying the body as the response to the operation invoked. |
| No | No | Categories | CategoriesIdentityType | See section 3.1.1.3 |
| Yes | No | Category | CategoryIdentityType | See section 3.1.1.3 |

Full SOAP Format

<soap:Envelope xmlns:soap=*"http://schemas.xmlsoap.org/soap/envelope/"*>

<soap:Body>

<QueryCategoriesResponse  
 xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<Categories>

<!-- 0 or more repetitions -->

<Category>

<identifier>?</identifier>

<name>?</name>

<description>?</description>

</Category>

</Categories>

</QueryCategoriesResponse>

</soap:Body>

</soap:Envelope>

Sample of Query Response

<QueryCategoriesResponse>

<Categories>

<!-- 0 or more repetitions -->

<Category>

<identifier>WPLANT</identifier>

<name>WindPlant</name>

<description>  
 A logical grouping of Wind Plants  
 </description>

</Category>

</Categories>

</QueryCategoriesResponse>

## Schedules

The Schedules message provides the ability to query for Schedules for which the participant is authorized. As discussed in the section 3.1.1.3, the response contains information about the available Schedules; of which ‘identifier’ values will be applied as query filters for subsequent operations (i.e., QueryForecast, etc.).

### Query Message

#### Purpose of Message

The purpose of this message is to request the collection of all authorized Schedules.

#### Mandatory and Optional Fields

To query for the Schedules the following empty XML element needs to be included in the request:

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | QuerySchedules | QuerySchedulesType | The outermost element which contains an empty sequence. |

#### SOAP Format

Full SOAP Message

<soapenv:Envelope  
 xmlns:soapenv=*"*[*http://schemas.xmlsoap.org/soap/envelope/*](http://schemas.xmlsoap.org/soap/envelope/)*"* xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:QuerySchedules/>

</soapenv:Body>

</soapenv:Envelope>

Sample of Query Submittal

<QuerySchedules/>

#### Data Returned

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | AuthorizationFault | Fault | An instance of the “FaultType” returned only when a fault occurs. See section 3.1.1.2.1 |
| No | No | QuerySchedulesResponse | QuerySchedulesResponseType | The outermost wrapper identifying the body as the response to the operation invoked. |
| No | No | Schedules | SchedulesIdentityType | See section 3.1.1.2 |
| Yes | No | Schedule | ScheduleIdentityType | See section 3.1.1.2 |

Full SOAP Format

<soap:Envelope  
 xmlns:soap=*"http://schemas.xmlsoap.org/soap/envelope/"*>

<soap:Body>

<QuerySchedulesResponse  
 xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<Schedules>

<!-- 0 or more repetitions -->

<Schedule>

<identifier>?</identifier>

<name>?</name>

<description>?</description>

<isReadOnly>?</isReadOnly>

</Schedule>

</Schedules>

</QuerySchedulesResponse>

</soap:Body>

</soap:Envelope>

Sample of Query Response

<QuerySchedulesResponse>

<Schedules>

<!-- 0 or more repetitions -->

<!-- Small sample of types represented below -->

<Schedule>

<identifier>10578005180101</identifier>

<name>STWPFCST\_5MIN-MW</name>

<description>  
 Short Term Wind Plant Forecast with 5 minutes data

granularity Power Generation MW value.  
 </description>

<isReadOnly>false</isReadOnly>

</Schedule>

</Schedules>

</QuerySchedulesResponse>

## Entities

The Entities message provides the ability to query for Entities to which the participant is authorized. As discussed in the section 3.1.1.3, the response contains information about the available Entities; of which ‘identifier’ values will be applied as query filters for subsequent operations (i.e., QueryForecast, etc.).

### Query Message

#### Purpose of Message

The purpose of this message is to request the collection of all accessible Entities.

#### Mandatory and Optional Fields

To query for the Entities the following data needs to be included in the request:

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | QueryEntities | QueryEntitiesType | The outermost element which contains the Category element. |
| Yes | No | Category | CategoryIdentityType | See section 3.1.1.2; contains the ‘identifier’ to apply as a filter to the Entity query. |

#### SOAP Format

Full SOAP Message

<soapenv:Envelope xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"* xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:QueryEntities>

<!-- Optional: -->

<wint:Category>

<wint:identifier>?</wint:identifier>

</wint:Category>

</wint:QueryEntities>

</soapenv:Body>

</soapenv:Envelope>

Sample of Query Submittal

<QueryEntities>

<Category>

<identifier>WPLANT</identifier>

</Category>

</QueryEntities>

#### Data Returned

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | AuthorizationFault | Fault | An instance of the “FaultType” returned only when a fault occurs. See section 3.1.1.2.1 |
| No | No | QueryEntitiesResponse | QueryEntitiesResponseType | The outermost wrapper identifying the body as the response to the operation invoked.  See section 3.1.1.3 |
| No | No | Entities | EntitiesIdentityType | See section 3.1.1.2 |
| Yes | No | Entity | EntityIdentityType | See section 3.1.1.2 |
| Yes | No | Category | CategoryIdentityType | See section 3.1.1.2 |

Full SOAP Format

<soap:Envelope  
 xmlns:soap=*"http://schemas.xmlsoap.org/soap/envelope/"*>

<soap:Body>

<QueryEntitiesResponse  
 xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<!-- 0 or 1 repetitions -->

<Category>

<identifier>WPLANT</identifier>

</Category>

<Entities>

<!-- 0 or more repetitions -->

<Entity>

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier>

<name>BRKW</name>

<description>BRKW</description>

<isReadOnly>false</isReadOnly>

</Entity>

</Entities>

</QueryEntitiesResponse>

</soap:Body>

</soap:Envelope>

Sample of Query Response

<QueryEntitiesResponse>

<!-- 0 or 1 repetitions -->

<Category>

<identifier>WPLANT</identifier>

</Category>

<Entities>

<!-- 0 or more repetitions -->

<Entity>

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier>

<name>BRKW</name>

<description>BRKW</description>

<isReadOnly>false</isReadOnly>

</Entity>

</Entities>

</QueryEntitiesResponse>

## Forecast

The Forecast message provides the ability to query and submit forecasts. Participants accessing this endpoint will only have access to the following forecasts:

Query Operations:

* Short Term Wind and Solar Plant Forecast
* Medium Term Wind and Solar Plant Forecast
* Long Term Wind and Solar Plant Forecast

Submit and Query Operations:

* Hourly Wind and Solar Plant Future Availability
* Daily Wind and Solar Plant Future Availability

Each item in the list above corresponds to a unique Schedule in the **e-terra***renewableplan* system – a listing of which is retrieved using the QuerySchedules operation (see section 5.2). By using the Schedule “identifier” contained within the response from the QuerySchedules operation, forecasts can be queried and submitted.

### Query Message

#### Purpose of Message

The purpose of this message is to query for submitted forecast data.

#### Mandatory and Optional Fields

To query for the Schedules the following data needs to be included in the request:

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | QueryForecast | ScheduleRequestType | The outermost element which contains the ScheduleRequest element. |
| No | No | ScheduleRequest | BaseRequestType | See section 3.1.1.2 |
| Yes | No | TimeRange | DateRangeType | See section 3.1.1.2  Response is filtered by the provided time range. |
| Yes | No | Category | CategoryIdentityType | As a convenience, if the query contains a Category and zero Entity elements, the response will contain all Entity elements associated with the Category.  See section 3.1.1.2 |
| No | No | Entities | EntitiesIdentityType | See section 3.1.1.2 |
| Yes | No | Entity | EntityIdentityType | If an Entity is included in the query, including the Category is unnecessary.  See section 3.1.1.2 |
| No | No | Schedule | ScheduleIdentityType | See section 3.1.1.2 |

#### SOAP Format

Full SOAP Message

<soapenv:Envelope

xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"* xmlns:wint=*"wint:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:QueryForecast>

<!-- 1 or more repetitions: -->

<wint:ScheduleRequest>

<wint:Schedule>

<wint:identifier>?</wint:identifier>

</wint:Schedule>

<!-- Optional: -->

<wint:TimeRange>

<wint:fromTime>?</wint:fromTime>

<wint:toTime>?</wint:toTime>

</wint:TimeRange>

<wint:Entities>

<!-- 0 or more repetitions: -->

<!-- **Option 1**: list of at least 1 Entity and   
 no Category. Entity can be specified by

Identifier, assetIdentifier, or both-->

<wint:Entity>

<wint:identifier>?</wint:identifier>

<wint:assetIdentifier>?</wint:assetIdentifier>

</wint:Entity>

</wint:Entities>

<!-- Optional: -->

<!-- **Option 2**: all Entities associated with this

Category will be included in the response if no

entities are provided -->  
 <wint:Category>

<wint:identifier>?</wint:identifier>

</wint:Category>

</wint:ScheduleRequest>

</wint:QueryForecast>

</soapenv:Body>

</soapenv:Envelope>

Sample of Query Submittal

<QueryForecast>

<!-- 1 or more repetitions: -->

<ScheduleRequest>

<Schedule>

<identifier>9905001</identifier>

</Schedule>

<!-- Optional: -->

<TimeRange>

<fromTime>2012-09-05T15:25:00Z</fromTime>

<toTime>2012-09-05T19:20:01Z</toTime>

</TimeRange>

<Entities>

<!-- 0 or more repetitions: -->

<Entity>

<!-- 1 or both identifiers -->

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier>

</Entity>

</Entities>

</ScheduleRequest>

</QueryForecast>

#### Data Returned

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | ForecastFault | Fault | An instance of the “FaultType” returned only when a fault occurs. See section 3.1.1.2.1 |
| No | No | QueryForecastResponse | PowerScheduleResponseType | The outermost wrapper identifying the body as the response to the operation invoked.  See section 3.1.1.3 |
| No | No | ScheduleResponse | PowerScheduleDataType | Wrapper for the query response results. |
| Yes | No | Category | CategoryIdentityType | See section 3.1.1.2 |
| No | No | Schedule | ScheduleIdentityType | See section 3.1.1.2 |
| Yes | No | TimeRange | DateRangeType | See section 3.1.1.2; Response is filtered by the provided time range. |
| Yes | No | TimeInterval | long | For informational purposes, provides the interval, in seconds, applying to all “time” elements in the subsequent time-series data.  For example:   * 300 = 5 minutes * 3600 = 1 hour * 10080 = 3 days |
| No | No | Entities | PowerEntitiesIdentityType | Contains Entity elements that have “Power” related time-series data children. |
| Yes | No | Entity | PowerEntityIdentityType | Extends EntityIdentityType by adding to that definition series of unbounded “Power” elements as children (PowerEntityIdentityType)  See (see section 3.1.1.2) |
| Yes | No | Power | TimeValueSeriesType | Wrapper element for time-series power data.  See section 3.1.1.2 |
| No | No | time | dateTime | See section 3.1.1.2 |
| No | No | value | decimal | Value is MW  See section 3.1.1.2 |

Full SOAP Format

<soap:Envelope  
 xmlns:soap=*"http://schemas.xmlsoap.org/soap/envelope/"*>

<soap:Body>

<QueryForecastResponse  
 xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<ScheduleResponse>

<Schedule>

<identifier>?</identifier>

<name>?</name>

</Schedule>

<TimeRange>

<fromTime>?</fromTime>

<toTime>?</toTime>

</TimeRange>

<TimeInterval>?</TimeInterval>

<Entities>

<Entity>

<identifier>?</identifier>

<assetIdentifier>?</assetIdentifier>

<name>?</name>

<Power>

<time>?</time>

<value>?</value>

</Power>

</Entity>

</Entities>

</ScheduleResponse>

</QueryForecastResponse>

</soap:Body>

</soap:Envelope>

Sample of Query Response

<QueryForecastResponse>

<!-- Example: a short term wind plant forecast -->

<ScheduleResponse>

<Schedule>

<identifier>10578005180101</identifier>

<!-- **‘**name’ included for informational purposes -->

<name>STWPFCST\_5MIN-MW</name>

</Schedule>

<TimeRange>

<fromTime>2012-09-05T15:25:00Z</fromTime>

<toTime>2012-09-05T19:20:01Z</toTime>

</TimeRange>

<!-- Time-series data in 5-minute intervals -->

<TimeInterval>300</TimeInterval>

<Entities>

<Entity>

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier>

<!-- **‘**name’ included for informational purposes -->

<name>BRKW</name>

<!-- 0 or more repetitions: -->

<Power>

<time>2012-09-05T15:25:00Z</time>

<value>1</value>

</Power>

</Entity>

</Entities>

</ScheduleResponse>

</QueryForecastResponse>

### Submit Message

#### Purpose of Message

The purpose of this message is to create a forecast. As mentioned in sections 5.1, 5.2, and 5.3, each forecast submission should contain valid Category (optional), Schedule, and Entity identifiers.

#### Mandatory and Optional Fields

To create a forecast, the following needs to be provided:

| Opt. | Nil. | Element or Attribute | Data Type; Format | Comments |
| --- | --- | --- | --- | --- |
| No | No | SubmitForecast | CreatePowerScheduleType | The outermost wrapper identifying the body as the forecast submission. |
| No | No | CreateSchedule | PowerScheduleDataType | Wrapper for the forecast submission. |
| No | No | Schedule | ScheduleIdentityType | See section 3.1.1.2 |
| Yes | No | TimeRange | DateRangeType | See section 3.1.1.2; |
| No | No | Entities | PowerEntitiesIdentityType | Contains Entity elements that have “Power” related time-series data children. |
| Yes | No | Entity | PowerEntityIdentityType | Extends EntityIdentityType by adding to that definition “Power” element children (PowerEntityIdentityType)  See (see section 3.1.1.2) |
| Yes | No | Power | TimeValueSeriesType | Container element for time-series power data.  See section 3.1.1.2 |

#### SOAP Format

Full SOAP Format

<soapenv:Envelope

xmlns:soapenv=*"http://schemas.xmlsoap.org/soap/envelope/"*

xmlns:wint=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<soapenv:Header/>

<soapenv:Body>

<wint:SubmitForecast>

<!-- 1 or more repetitions: -->

<wint:CreateSchedule>

<!-- 1 or more repetitions: -->

<wint:Schedule>

<wint:identifier>9905001</wint:identifier>

</wint:Schedule>

<!-- Optional: -->

<wint:TimeRange>

<wint:fromTime>2012-09-05T15:25:00Z</wint:fromTime>

<wint:toTime>2012-09-05T19:20:01Z</wint:toTime>

</wint:TimeRange>

<wint:Entities>

<!-- 0 or more repetitions: -->

<wint:Entity>

<!-- 1 or both identifiers -->

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier>

<!-- 0 or more repetitions: -->

<Power>

<time>2012-09-05T15:25:00Z</time>

<value>1</value>

</Power>

</wint:Entity>

</wint:Entities>

</wint:CreateSchedule>

</wint:SubmitForecast>

</soapenv:Body>

</soapenv:Envelope>

Sample of a Submittal

<SubmitForecast>

<!-- 1 or more repetitions: -->

<CreateSchedule>

<!-- 1 or more repetitions: -->

<Schedule>

<identifier>9905001</identifier>

</Schedule>

<!-- Optional: -->

<TimeRange>

<fromTime>2012-09-05T15:25:00Z</fromTime>

<toTime>2012-09-05T19:20:01Z</toTime>

</TimeRange>

<Entities>

<!-- 0 or more repetitions: -->

<Entity>

<!-- 1 or both identifiers -->

<identifier>10245</identifier>

<assetIdentifier>20486</assetIdentifier>

<!-- 0 or more repetitions: -->

<Power>

<time>2012-09-05T15:25:00Z</time>

<value>1</value>

</Power>

</Entity>

</Entities>

</CreateSchedule>

</SubmitForecast>

Response Message

This message has a standard response as defined in section 2.1.

# Appendix A – RPLAN Enhancements for Asset ID

Wind and solar plant identification in web services has been changed to allow usage of Asset ID, which is a number attributed to each unit in CAMS and used in all the ISO-NE systems. Until now, RPLAN web services used another identifier called Entity ID. Participants had to obtain this number in order to use it in queries and submittals. In the new version, wind and solar plants can be identified by either Asset ID, or Entity ID, or both numbers. The main advantage of this change is that for the plants that do not have the same Entity ID in Sandbox and Production systems, it will be possible to use just Asset ID, which is the same across all systems.

In the new version of web services, the response files include Asset ID in addition to Entity ID. The client software might need to be adjusted to accept this additional element or to ignore it. The current format of submit files, which use only Entity ID, will work with the new version, as Asset ID is an optional element.

In order to take advantage of the new way of identifying plants using Asset ID in web service submittals, the client software has to be recompiled with the new WSDL and XSD.

Please see RPLAN Data Exchange Specification document for details regarding the updated structure of web services.

Refer to sample .Net and java programs for details regarding changes in client software.

1. Services affected by this enhancement

All the services that expect the plant identifier or return the plant identifier will be using Entity ID or Asset ID or both. This includes:

* Query Entities
* Query Forecast
* Submit Forecast

1. XML file format changes
2. Example of Query Entities:

Request

<QueryEntities  
 xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<Category>

<identifier>WPLANT</identifier>

</Category>

</QueryEntities>

Response

<QueryEntitiesResponse  
 xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<Category>

<identifier>WPLANT</identifier>

</Category>

<Entities>

<Entity>

<identifier>\*\*\*</identifier>

<assetIdentifier>\*\*\*</assetIdentifier>

<name>\*\*\*\*\*\*</name>

<description>\*\*\*\*\*\*</description>

<isReadOnly>false</isReadOnly>

</Entity>

</Entities>

</QueryEntitiesResponse>

1. Examples of Hourly WPFA submittals:

Request

<SubmitForecast>

xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<CreateSchedule>

<Schedule>

<identifier>\*05070101</identifier>

</Schedule>

<Entities>

<Entity>

<identifier>\*\*\*</identifier>

<assetIdentifier>\*\*\*</assetIdentifier>

<name />

<description />

<Power>

<time>2016-07-26T14:00:00-04:00</time>

<value>11.62</value>

</Power>

. . .

</Entity>

</Entities>

</CreateSchedule>

</SubmitForecast>

<SubmitForecast>

xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<CreateSchedule>

<Schedule>

<identifier>\*05070101</identifier>

</Schedule>

<Entities>

<Entity>

<identifier>\*\*\*</identifier>

<name />

<description />

<Power>

<time>2016-07-26T14:00:00-04:00</time>

<value>11.62</value>

</Power>

. . .

</Entity>

</Entities>

</CreateSchedule>

</SubmitForecast>

<SubmitForecast>

xmlns=*"urn:com.alstom.isone.windint.windintegration:1-0"*>

<CreateSchedule>

<Schedule>

<identifier>\*05070101</identifier>

</Schedule>

<Entities>

<Entity>

<assetIdentifier>\*\*\*</assetIdentifier>

<name />

<description />

<Power>

<time>2016-07-26T14:00:00-04:00</time>

<value>11.62</value>

</Power>

. . .

</Entity>

</Entities>

</CreateSchedule>

</SubmitForecast>

1. Error messages

The following error messages are returned in the soap response if the submitted Entity ID or Asset ID values are not valid.

| Condition | Error Message |
| --- | --- |
| Entity ID and Asset ID are valid but do not belong to the same plant | Entity Identifier \*\*\* and Asset Identifier \*\*\* do not belong to the same entity |
| Entity ID or Asset ID are not valid | Entity Identifier is not authorized: \*\*\*  Asset Identifier is not authorized: \*\*\* |
| Entity ID and Asset ID are valid but do not belong to the participant specified in the Schedule Identifier field | Request did not contain any active authorized entities for participant |

1. The samples within this document reference SOAP 1.1 as indicated by the namespace "http://schemas.xmlsoap.org/soap/envelope/". [↑](#footnote-ref-1)