NORTH AMERICAN ENERGY STANDARDS BOARD

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1. General Description

This Technical Guide will describe how OATI webRegistry supports a web services architecture that provides data and application services to users' systems. By using web services, customers can retrieve data available in webRegistry, as well as request the execution of specific application functions.

Web service technology enables diverse systems to communicate with ease in real time. OATI webRegistry has been enhanced to support web services, in addition to other facilities, to provide data exchanges in and out of the system.

In the context of webRegistry, web services can be described as the ability to remotely call a process via HTTPS protocol. Both the caller and called process (client and server) comply with the underlying communication protocol and can be developed using different software technologies and architectures independently of each other.

Web service clients and servers communicate with one another in a language called eXtensible Markup Language (XML) irrespective of Operating System, platforms, or programming languages. The grammar for the communication is referred to as Simple Object Access Protocol (SOAP). SOAP is used to wrap around the language and is often referred to as the *envelope*. The envelope contains the address, mode of delivery, and instructions written in XML.

Web Services employ the notion of *methods* that can be called by client processes. Once a web service is created, it is announced (or published) to the outside world though a document known as Web Services Description Language (WSDL) file. Many methods supported by a given server can be described in a single WSDL file. The WSDL is the only source of information needed by a client to issue a request to the server.

The WSDL file contains all functions (or methods) that can be called by external parties. The WSDL describes parameters (if any) as well as the accompanying data types. This file also contains definitions of what type of data will be returned, if any. The WSDL exposes all the necessary information required for the services provided to be consumed.

For the consumer of a web service, one needs to know the address or location of the web service, as well as the method to be consumed. The main attraction of using web services is

that they are platform and language are independent. Because of this, both the consumer and provider may be located on different platforms and implemented in different languages.

It is assumed the audience of this document is familiar with basic concepts and terminology of web services, such as SOAP, XML Schemas, XML Namespaces, and XML parsing and validation.

2. Implementation Guidelines

In order to use the web service framework provided by webRegistry, the user is expected to prepare a SOAP message wrapped around an XML based structure that complies with the specification contained in the WSDL. This file contains all the various methods (functions) supported by the web service. In addition, the file also details the expected XML structure to use when invoking any of these methods.

The method specification includes the parameters with the accompanying data type. There are two broad categories of data type. The first is simple type, which contains the String, Number, Date, etc. The second is a complex type, which is a data type that is made up of zero or more simple types, as well as zero or more complex types. To view the content of the WSDL file, the user needs to do an HTTP GET request against the web service location.

2.1 SOAP Message Structure

The SOAP message must have a *SOAPAction* header included in the HTTP request. The *SOAPAction* identifies the Method or Function that is to be invoked. A typical SOAP message request could be depicted as shown below:

```
POST   /cgi-bin/webplus.dll?script=/naesbwry/WREG-Web-Services-Main.wml HTTP/ 1.1
Host: dev.naesbwry.oati.com
Content-Type: text/xml; charset="utf-8"
Content-Length: nnnn
SOAPAction: DownloadEntity

<?xml version="1.0"?>
<SOAP-ENV:Envelope
            xmlns:SOAP-ENV="http://schemas.xmlsoap.org/soap/envelope/"
        xmlns:xsi="http://www.w3.org/1999/XMLSchema-instance"
        xmlns:xsd="http://www.w3.org/1999/XMLSchema">
  <SOAP-ENV:Body>
   <DownloadEntity
     xmlns="http://www.oati.net/namespace"
     SOAP-ENV:encodingStyle="http://schemas.xmlsoap.org/soap/encoding/">
            <EffectiveDate>02/22/2011</EffectiveDate>
   </DownloadEntity>
  </SOAP-ENV:Body>
</SOAP-ENV:Envelope>
```

In the example above, the *DownloadEntity* block represents the request message. The response could either be a fault response, which signifies that the request could not be

processed due to a variety of reasons, or a success response including the requested data. Reasons for fault responses can include *SOAPAction* specification not being found, the Request Message not being in the expected format, or a variety of other reasons related to the construct of the message.

The response message will contain an indicator of the outcome of the request made. A sample of possible messages returned are shown below:

```
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/">
 <soap:Body>
   <soap:Fault>
     <faultcode>soap:Server</faultcode>
     <faultstring>
             SOAPAction:http://www.oati.net/namespace/webRegistry is not valid
     </faultstring>
   </soap:Fault>
 </soap:Body>
</soap:Envelope>
```

The sample above contains a response that is a Soap Fault block. This indicates the requested method is not valid. Often, when a Soap fault block is returned, it is an indication that the request did not conform to the specification of SOAP messaging.

```
<?xml version="1.0"?>
<soap:Envelope xmlns:soap=http://schemas.xmlsoap.org/soap/envelope/
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
<soap:Body>
    <d1:DownloadEntityResponse xmlns:d1="http://www.oati.net/namespace">
           <DownloadEntityResult>
                   <ErrorDesc>webRegistry: Entity does not exists</ErrorDesc>
           </DownloadEntityResult>
    </d1:DownloadEntityResponse>
</soap:Body>
</soap:Envelope>
```

The sample above contains a response that is an indicator the SOAP request was processed, but no matching entities were found.

```
<?xml version="1.0"?>
<soap:Envelope
    xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
    xmlns:xsd="http://www.w3.org/2001/XMLSchema">
```

```
<soap:Body>
    <d1:WTDealExportResponse xmlns:d1="http://www.oati.net/namespace">
        <WTDealExportResult>
                <AddressLine1>1</AddressLine1>
                <Deal>
                <DealNumber>1000</DealNumber>
                <BaseImportExport>
                        <AddressLine1>CONFIRMED</AddressLine1>
                <CounterPartyName>AEP</CounterPartyName>
                <CounterPartyTrader>AEP Trader
                        </CounterPartyTrader>
                <TransactionType>P</TransactionType>
                        ……..
                <EnergyProfile>
                        <TypeEnergyProfile>
                        <StartDate>2003-10-14</StartDate>
                        <EndDate>2003-10-14</EndDate>
                        <EP_Block>
                                <TypeEP_Block>
                                        <EP_HE>0100</EP_HE>
                                        <EP_MW>100.0</EP_MW>
                                        <EP_InitialDate>20.0</EP_InitialDate>
                                    </TypeEP_Block>
                                    …..
                        </EP_Block>
                        </TypeExnergyProfile>
                </EnergyProfile>
                </BaseImportExport>
                </Deal>
        </WTDealExportResult>
        </d1:WTDealExportResponse>
 </soap:Body>
 </soap:Envelope>
```

The sample message above is response text indicating the request was processed correctly and the requested information returned.

The web service implementation is a two way request – response – mode. A request is made and a response is given which could be a SUCCESS or FAILURE response.

2.2 Location

The URL to access the web services provided by webRegistry is:

Item	Location
Web Service URL in Production	https://www.naesbwry.oati.com/cgi-bin/webplus.dll?Script=/naesbwry/WREG-Web-Services-Main.wml
Web Service URL in Development	https://dev.naesbwry.oati.com/cgi-bin/webplus.dll?Script=/naesbwry/WREG-Web-Services-Main.wml

The same URL can be accessed to get the WSDL content, by submitting a regular HTTP GET request

2.3 Functionality

The main functionality provided by webRegistry web services is to support webRegistry integration with other applications supporting web services.

2.4 Logging

A log of all web service requests and corresponding responses, if any, will be maintained and accessible by users. The log can be viewed by and sorted by date. In addition, Audit Trail information can be used in most cases to view events that may be associated with service requests.

2.5 Security

Several security measures are in place for the purposes of web services usage. First, the web service location is hosted on a secure server and only HTTPS protocol will be allowed. Second, before any action is taken on any web service request, a digitally signed certificate that has been successfully associated with a webRegistry user must be provided. Only requests accompanied with the appropriate certificate will be processed.

2.6 Soap Fault Response

Server failure, where the service becomes unavailable, will be handled by Soap Fault Response. In addition, any data type or WSDL schema validation error will be handled by the Soap Fault Response. In the event of Soap Fault Response, a user can retrigger the method call at any time knowing they will receive the same response if the failure is caused by data type or WSDL schema violation.

3. Hosted webRegistry Web Service Methods

3.1 DownloadEntity

3.1.1 Description

webRegistry allows for the retrieval of entities through the web service. The *DownloadEntity* method is accessible through the standard OATI webRegistry web service mechanism. If Effective Date is not provided, this query will return the last published Entities.

3.1.2 Parameters

3.1.2.1 Input Parameters

Element Name	Data Type/ Requirement	Description/ Notes
EffectiveDate	Date *Optional*	The effective date of the entities to be retrieved.
Version	String *Optional*	The version of the entities to be retrieved (i.e., ACTIVE, PENDING, FUTURE, or ARCHIVED).

3.1.2.2 Output Parameters

Element Name	Data Type/ Requirement	Description/ Notes
OutputStruct	Complex *Required*	Element that encapsulates the output elements.
ReturnCode	ReturnCode *Required*	The outcome of the processing of the method. 0 for SUCCESS and 1 for FAILURE. Since the payload can only have one EffectiveDate, FAILURE outcome means the retrieval cannot be processed successfully and SUCCESS outcome means the retrieval have been processed successfully.
ReturnCodeDesc	ReturnCodeDesc *Required*	The outcome of the processing of the method in string. The possible values are SUCCESS or FAILURE.
Error	Complex *Optional*	Element that encapsulates one or more ErrorStruct elements.
ErrorStruct	Complex *Required*	Element that encapsulates the error information.
ErrorCode	Integer *Required*	The error code based on the list provided in 'Method Specific Error Codes' section or in 'Generic Error Codes' section.
ErrorCodeDesc	String *Required*	The error code description based on the list provided in 'Method

Element Name	Data Type/ Requirement	Description/ Notes
		Specific Error Codes' section or in 'Generic Error Codes' section. In addition, additional error messages will be included as well if needed.
ErrorXPath	String *Optional*	Pointer/path to specific input that cannot be processed successfully.
Success	Complex *Optional*	Element that encapsulates one or more EntityStructs.
EntityStruct	Complex *Required*	Element that encapsulates elements defining attributes for one entity.
ID	Integer *Required*	The unique system identifier associated to the object registration. (Old Attribute Name: N/A)
TaggingEntityID	Integer *Required*	The unique system identifier associated to the object registration from TSIN. (Old Attribute Name: Record_ID)
Entity_Type	String *Optional*	The business role associated with the entity registration. (Old Attribute Name: Entity_Type)
NERCID	Integer *Optional*	Key that uniquely identifies a particular entity role/code within the current NERC registry. (Old Attribute Name: NERC_ID)
DUNS	String *Required*	DUNS Number associated to the entity, which uniquely identifies the entity. (Old Attribute Name: Duns)
ShortName	String *Required*	An abbreviated official/legal entity name. (Old Attribute Name: Entity_Code)
LongName	String *Required*	Full official/legal entity name. (Old Attribute Name: Entity_Name)
EntityCodeRole	EntityCodeRole *Optional*	The Entity Code-Role(s) associated with the entity registration. (Old Attribute Name: N/A)
StartEffectiveDate	Date *Required*	The start date that delineate the time period of the entity registration. (Old Attribute Name: Begin_Date)
StopEffectiveDate	Date *Required*	The end date that delineate the time period of an entity registration. (Old Attribute Name: End_Date)

Element Name	Data Type/ Requirement	Description/ Notes
InitialDate	Date *Required*	The first date the entity is effective. (Old Attribute Name: Initial_Date)
URL	String *Optional*	An address of entity's web page if available. (Old Attribute Name: Entity URL)
PredecessorName	String *Optional*	Name of associations with existing registered entities, which gave rise to a formation of the new entity. (Old Attribute Name: N/A)
AddressLine1	String *Optional*	Mailing address of entity's business location. (Old Attribute Name: Address_Line_One)
AddressLine2	String *Optional*	Mailing address of entity's business location. (Old Attribute Name: Address_Line_Two)
City	String *Optional*	City of entity's business location. (Old Attribute Name: City)
State	String *Optional*	State of entity's business location. (Old Attribute Name: State)
PostalCode	String *Optional*	Postal Code of entity's business location. (Old Attribute Name: Zip_Code)
CountryCode	String *Optional*	Country Code of entity's business location. (Old Attribute Name: Country)
PrimaryContactName	String *Optional*	Name of primary contact for entity business operations. (Old Attribute Name: Prim_Contact)
PrimaryContactPhoneNbr	String *Optional*	Phone number of primary contact for entity business operations. (Old Attribute Name: Prim_Phone)
PrimaryContactFaxNbr	String *Optional*	Fax number of primary contact for entity business operations. (Old Attribute Name: Prim_Fax)
PrimaryContactEmail	String *Optional*	Email address of primary contact for entity business operations. (Old Attribute Name: Prim_Email)
AdminContactName	String *Optional*	Name of administrative contact for entity business operations. (Old Attribute Name: Admin_Contact)
AdminContactPhoneNbr	String *Optional*	Phone number of administrative contact for entity business operations.

Element Name	Data Type/ Requirement	Description/ Notes
		(Old Attribute Name: Admin_Email)
AdminContactFaxNbr	String *Optional*	Fax number of administrative contact for entity business operations. (Old Attribute Name: Admin_Fax)
AdminContactEmail	String *Optional*	Email address of administrative contact for entity business operations. (Old Attribute Name: Admin_Email)

3.1.3 Method Specific Error Codes

N/A.

3.1.4 Sample XML

```xml
<?xml version="1.0"?>
<soap:Envelope xmlns:soap=http://schemas.xmlsoap.org/soap/envelope/ xmlns:xsd=http://www.w3.org/2001/XMLSchema
xmlns:m0=http://www.oati.net/namespace/tvawtm/MRKT_WebServices>
        <soap:Body>
                <m:DownloadEntity xmlns:m="http://www.oati.net/namespace">
                        <m0:EffectiveDate>09/10/2010</m0:EffectiveDate>
                </m:DownloadEntity>
        </soap:Body>
</soap:Envelope>
```

3.1.5 Successful Response

```xml
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Body>
                <d1:DownloadEntityResponse xmlns:d1="http://www.oati.net/namespace">
                        <d2:OutputStruct xmlns:d2="http://www.oati.net/namespace/webRegistry/MRKT_WebServices">
                                <d2:ReturnCode>0</d2:ReturnCode>
                                <d2:ReturnCodeDesc>SUCCESS</d2:ReturnCodeDesc>
                                <d2:Success>
                                        <d2:EntityStruct>
                                                <d2:ID>12</d2:ID>
                                                <d2:TaggingEntityID>12</d2:TaggingEntityID>
                                                <d2:Entity_Type>O/SE</d2:Entity_Type>
                                                <d2:NERCID>1234</d2:NERCID>
                                                <d2:DUNS>987654321</d2:DUNS>
                                                <d2:ShortName>Short Name</d2:ShortName>
                                                <d2:LongName>Long Name</d2:LongName>
                                                <d2:EntityCodeRole>BA</d2:EntityCodeRole>
                                                <d2:StartEffectiveDate>02/22/2010</d2:StartEffectiveDate>
                                                <d2:StopEffectiveDate>02/22/2010</d2:StopEffectiveDate>
                                                <d2:InitialDate>02/22/2010</d2:InitialDate>
                                                <d2:AddressLine1>Address Line 1</d2:AddressLine1>
                                                <d2:State>State</d2:State>
                                                <d2:PostalCode>12345</d2:PostalCode>
                                                <d2:CountryCode>US</d2:CountryCode>
                                                <d2:PrimaryContactName>Name</d2:PrimaryContactName>
                                                <d2:PrimaryContactPhoneNbr>612-208-4200</d2:PrimaryContactPhoneNbr>
                                                <d2:PrimaryContactFaxNbr>763-201-2000</d2:PrimaryContactFaxNbr>
                                                <d2:PrimaryContactEmail>sam@oati.net</d2:PrimaryContactEmail>
                                        </d2:EntityStruct>
                                </d2:Success>
                        </d2:OutputStruct>
                </d1:DownloadEntityResponse>
        </soap:Body>
</soap:Envelope>
```

3.1.6 Failure Response

```xml
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Body>
                        <d1:DownloadEntityResponse xmlns:d1="http://www.oati.net/namespace">
                                        <d2:OutputStruct xmlns:d2="http://www.oati.net/namespace/webRegistry/MRKT_WebServices">
                                                <d2:ReturnCode>1</d2:ReturnCode>
                                                <d2:ReturnCodeDesc>FAILURE</d2:ReturnCodeDesc>
                                                <d2:Error>
                                                        <d2:ErrorStruct>
                                                                <d2:ErrorCode>0</d2:ErrorCode>
                                                                <d2:ErrorCodeDesc>String</d2:ErrorCodeDesc>
                                                                <d2:ParentElementIndex>String</d2:ParentElementIndex>
                                                        </d2:ErrorStruct>
                                                        <d2:ErrorStruct>
                                                                <d2:ErrorCode>0</d2:ErrorCode>
                                                                <d2:ErrorCodeDesc>String</d2:ErrorCodeDesc>
                                                                <d2:ParentElementIndex>String</d2:ParentElementIndex>
                                                        </d2:ErrorStruct>
                                                </d2:Error>
                                        </d2:OutputStruct>
                        </d1:DownloadEntityResponse>
        </soap:Body>
</soap:Envelope>
```

3.2 DownloadBA

3.2.1 Description

webRegistry allows for the retrieval of BAs through the web service. The *DownloadBA* method is accessible through the standard webRegistry web service mechanism. If Effective Date is not provided, this query will return the last published BAs.

3.2.2 Parameters

3.2.2.1 Input Parameters

Element Name	Data Type/ Requirement	Description/ Notes
EffectiveDate	Date *Optional*	The effective date of the BAs to be retrieved.
Version	String *Optional*	The version of the BAs to be retrieved (i.e. ACTIVE, PENDING, FUTURE, or ARCHIVED).

3.2.2.2 Output Parameters

Element Name	Data Type/ Requirement	Description/ Notes
OutputStruct	Complex *Required*	Element that encapsulates the output elements.
ReturnCode	ReturnCode *Required*	The outcome of the processing of the method. 0 for SUCCESS and 1 for FAILURE. Since the payload can only have one EffectiveDate, FAILURE outcome means the retrieval cannot be processed successfully and SUCCESS outcome

Element Name	Data Type/ Requirement	Description/ Notes
		means the retrieval have been processed successfully.
ReturnCodeDesc	ReturnCodeDesc *Required*	The outcome of the processing of the method in string. The possible values are SUCCESS or FAILURE.
Error	Complex *Optional*	Element that encapsulates one or more ErrorStruct elements.
ErrorStruct	Complex *Required*	Element that encapsulates the error information.
ErrorCode	Integer *Required*	The error code based on the list provided in 'Method Specific Error Codes' section or in 'Generic Error Codes' section.
ErrorCodeDesc	String *Required*	The error code description based on the list provided in 'Method Specific Error Codes' section or in 'Generic Error Codes' section. In addition, additional error messages will be included as well if needed.
ErrorXPath	String *Optional*	Pointer/path to specific input that cannot be processed successfully.
Success	Complex *Optional*	Element that encapsulates one or more BAStructs.
BAStruct	Complex *Required*	Element that encapsulates elements defining attributes for one BA.
ID	Integer *Required*	The unique system identifier associated to the object registration. (Old Attribute Name: N/A)
TaggingEntityID	Integer *Required*	The unique system identifier associated to the object registration. (Old Attribute Name: TaggingEntityID)
LongName	String *Required*	Full official/legal entity name. (Old Attribute Name: Entity_Name)
Code	String *Optional*	The entity code of the entity registration. (Old Attribute Name: Entity_Code)
ShortName	String *Required*	An abbreviated official/legal entity name. (Old Attribute Name: N/A)
NERCID	Integer *Optional*	Key that uniquely identifies a particular entity role/code within the current NERC registry.

Element Name	Data Type/ Requirement	Description/ Notes
		(Old Attribute Name: NERC_ID)
StartEffectiveDate	Date *Required*	The start date that delineate the time period of the entity registration. (Old Attribute Name: Begin_Date)
StopEffectiveDate	Date *Required*	The end date that delineate the time period of an entity registration. (Old Attribute Name: End_Date)
ReliabilityAreaName	String *Required*	Reliability Area name of entity registration. (Old Attribute Name: SC_Code)
ReliabilityRegionName	String *Required*	Reliability Region name of entity registration. (Old Attribute Name: Region)
MarketAreaName	String *Required*	Market Area name of entity registration. (Old Attribute Name: N/A)
InterconnectionName	String *Required*	Interconnection name of entity registration. (Old Attribute Name: N/A)
BA	String *Required*	Entity Role. (Old Attribute Name: N/A)
NHMBAMFlagStr	String *Optional*	Next Hour Market flag indicator. (Old Attribute Name: 0-NHMBAM_Flag)
MarketOperatorFlagStr	String *Optional*	Market Operator flag indicator. (Old Attribute Name: MarketOperatorFlag)
PseudoCAFlagStr	String *Optional*	Psuedo CA flag indicator. (Old Attribute Name: Pseudo_CA)
Hr24ContactName	String *Optional*	24 hour contact name for entity business operations. (Old Attribute Name: Contact24)
Hr24ContactPhoneNbr	String *Optional*	24 hour contact phone number for entity business operations. (Old Attribute Name: Phone24)
Hr24ContactFaxNbr	String *Optional*	24 hour contact fax number for entity business operations. (Old Attribute Name: Fax)
Alt1ContactName	String *Optional*	Alternative contact name for business operations. (Old Attribute Name: ALT1Desc)
Alt1ContactPhoneNbr	String *Optional*	Alternative contact phone number for business operations. (Old Attribute Name: ALT1Phone)
Alt2ContactName	String	Alternative contact name for

Element Name	Data Type/ Requirement	Description/ Notes
	Optional	business operations. (Old Attribute Name: ALT2Desc)
Alt2ContactPhoneNbr	String *Optional*	Alternative contact phone number for business operations. (Old Attribute Name: ALT2Phone)
Alt3ContactName	String *Optional*	Alternative contact name for business operations. (Old Attribute Name: ALT3Desc)
Alt3ContactPhoneNbr	String *Optional*	Alternative contact phone number for business operations. (Old Attribute Name: ALT3Phone)
AgentURL	String *Optional*	Tag Agent service URL for entity registration. (Old Attribute Name: Agent_URL)
AuthorityURL	String *Optional*	Tag Authority service URL for entity registration. (Old Attribute Name: Authority_URL)
ApprovalURL	String *Optional*	Tag Approval service URL for entity registration. (Old Attribute Name: Approval_URL)
ForwardURL	String *Optional*	Tag Forwarding service URL for entity registration. (Old Attribute Name: Forward_URL)

3.2.3 Method Specific Error Codes

N/A.

3.2.4 Sample XML

```
<?xml version="1.0"?>
<soap:Envelope xmlns:soap=http://schemas.xmlsoap.org/soap/envelope/ xmlns:xsd=http://www.w3.org/2001/XMLSchema
xmlns:m0=http://www.oati.net/namespace/tvawtm/MRKT_WebServices>
        <soap:Body>
                <m:DownloadBA xmlns:m="http://www.oati.net/namespace">
                        <m0:EffectiveDate>09/10/2010</m0:EffectiveDate>
                </m:DownloadBA>
        </soap:Body>
</soap:Envelope>
```

3.2.5 Successful Response

```
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Body>
                <d1:DownloadBAResponse xmlns:d1="http://www.oati.net/namespace">
                        <d2:OutputStruct xmlns:d2="http://www.oati.net/namespace/webRegistry/MRKT_WebServices">
                                <d2:ReturnCode>0</d2:ReturnCode>
                                <d2:ReturnCodeDesc>SUCCESS</d2:ReturnCodeDesc>
                                <d2:Success>
                                        <d2:BAStruct>
                                                <d2:ID>12</d2:ID>
                                                <d2:TaggingEntityID>12</d2:TaggingEntityID>
                                                <d2:LongName>Long Name</d2:LongName>
```

```
                                                <d2:Code>Code</d2:Code>
                                                <d2:ShortName>Short Name</d2:ShortName>
                                                <d2:NERCID>12345</d2:NERCID>
                                                <d2:StartEffectiveDate>02/22/2010</d2:StartEffectiveDate>
                                                <d2:StopEffectiveDate>02/22/2010</d2:StopEffectiveDate>
                                                <d2:ReliabilityAreaName>RRO</d2:ReliabilityAreaName>
                                                <d2:ReliabilityRegionName>Region</d2:ReliabilityRegionName>
                                                <d2:MarketAreaName>MO</d2:MarketAreaName>
                                                <d2:InterconnectionName>Interconnection</d2:InterconnectionName>
                                                <d2:BA>BA</d2:BA>
                                                <d2:AgentURL>AgentURL</d2:AgentURL>
                                                <d2:ForwardURL>ForwardURL</d2:ForwardURL>
                                                <d2:Hr24ContactName>Name</d2:Hr24ContactName>
                                                <d2:Hr24ContactPhoneNbr>612-208-4200</d2:Hr24ContactPhoneNbr>
                                                <d2:Hr24ContactFaxNbr>763-201-2000</d2:Hr24ContactFaxNbr>
                                        </d2:BAStruct>
                                </d2:Success>
                        </d2:OutputStruct>
                </d1:DownloadBAResponse>
        </soap:Body>
</soap:Envelope>
```

3.2.6 Failure Response

```
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Body>
                <d1:DownloadBAResponse xmlns:d1="http://www.oati.net/namespace">
                        <d2:OutputStruct xmlns:d2="http://www.oati.net/namespace/webRegistry/MRKT_WebServices">
                                <d2:ReturnCode>1</d2:ReturnCode>
                                <d2:ReturnCodeDesc>FAILURE</d2:ReturnCodeDesc>
                                <d2:Error>
                                        <d2:ErrorStruct>
                                                <d2:ErrorCode>0</d2:ErrorCode>
                                                <d2:ErrorCodeDesc>String</d2:ErrorCodeDesc>
                                                <d2:ParentElementIndex>String</d2:ParentElementIndex>
                                        </d2:ErrorStruct>
                                        <d2:ErrorStruct>
                                                <d2:ErrorCode>0</d2:ErrorCode>
                                                <d2:ErrorCodeDesc>String</d2:ErrorCodeDesc>
                                                <d2:ParentElementIndex>String</d2:ParentElementIndex>
                                        </d2:ErrorStruct>
                                </d2:Error>
                        </d2:OutputStruct>
                </d1:DownloadBAResponse>
        </soap:Body>
</soap:Envelope>
```

3.3 DownloadPSE

3.3.1 Description

webRegistry allows for the retrieval of PSEs through the web service. The *DownloadPSE* method is accessible through the standard webRegistry web service mechanism. If Effective Date is not provided, this query will return the last published PSEs.

3.3.2 Parameters

3.3.2.1 Input Parameters

Element Name	Data Type/ Requirement	Description/ Notes
EffectiveDate	Date *Optional*	The effective date of the PSEs to be retrieved.
Version	String *Optional*	The version of the PSEs to be retrieved (i.e. ACTIVE, PENDING, FUTURE, or ARCHIVED).

3.3.2.2 Output Parameters

Element Name	Data Type/ Requirement	Description/ Notes
OutputStruct	Complex *Required*	Element that encapsulates the output elements.
ReturnCode	ReturnCode *Required*	The outcome of the processing of the method. 0 for SUCCESS and 1 for FAILURE. Since the payload can only have one EffectiveDate, FAILURE outcome means the retrieval cannot be processed successfully and SUCCESS outcome means the retrieval have been processed successfully.
ReturnCodeDesc	ReturnCodeDesc *Required*	The outcome of the processing of the method in string. The possible values are SUCCESS or FAILURE.
Error	Complex *Optional*	Element that encapsulates one or more ErrorStruct elements.
ErrorStruct	Complex *Required*	Element that encapsulates the error information.
ErrorCode	Integer *Required*	The error code based on the list provided in 'Method Specific Error Codes' section or in 'Generic Error Codes' section.
ErrorCodeDesc	String *Required*	The error code description based on the list provided in 'Method Specific Error Codes' section or in 'Generic Error Codes' section. In

Element Name	Data Type/ Requirement	Description/ Notes
		addition, additional error messages will be included as well if needed.
ErrorXPath	String *Optional*	Pointer/path to specific input that cannot be processed successfully.
Success	Complex *Optional*	Element that encapsulates one or more BAStructs.
PSEStruct	Complex *Required*	Element that encapsulates elements defining attributes for one PSE.
ID	Integer *Required*	The unique system identifier associated to the object registration. (Old Attribute Name: N/A)
TaggingEntityID	Integer *Required*	The unique system identifier associated to the object registration from TSIN. (Old Attribute Name: TaggingEntityID)
LongName	String *Required*	Full official/legal entity name. (Old Attribute Name: Entity_Name)
Code	String *Optional*	The entity code of the entity registration. (Old Attribute Name: Entity_Code)
ShortName	String *Required*	An abbreviated official/legal entity name. (Old Attribute Name: N/A)
NERCID	Integer *Optional*	Key that uniquely identifies a particular entity role/code within the current NERC registry. (Old Attribute Name: NERC_ID)
StartEffectiveDate	Date *Required*	The start date that delineate the time period of the entity registration. (Old Attribute Name: Begin_Date)
StopEffectiveDate	Date *Required*	The end date that delineate the time period of an entity registration. (Old Attribute Name: End_Date)
PSEType	String *Required*	Subtype of entity registration. (Old Attribute Name: N/A)
ReliabilityRegionName	String *Required*	Reliability Region name of entity registration. (Old Attribute Name: Region)
NHMBAMFlagStr	String *Optional*	Next Hour Market flag indicator. (Old Attribute Name: TaggingEntityID)

Element Name	Data Type/ Requirement	Description/ Notes
MarketOperatorFlagStr	String *Optional*	Market Operator flag indicator. (Old Attribute Name: MarketOperatorFlag)
PseudoCAFlagStr	String *Optional*	Psuedo CA flag indicator. (Old Attribute Name: Pseudo_CA)
Hr24ContactName	String *Optional*	24 hour contact name for entity business operations. (Old Attribute Name: Contact24)
Hr24ContactPhoneNbr	String *Optional*	24 hour contact phone number for entity business operations. (Old Attribute Name: Phone24)
Hr24ContactFaxNbr	String *Optional*	24 hour contact fax number for entity business operations. (Old Attribute Name: Fax)
Alt1ContactName	String *Optional*	Alternative contact name for business operations. (Old Attribute Name: ALT1Desc)
Alt1ContactPhoneNbr	String *Optional*	Alternative contact phone number for business operations. (Old Attribute Name: ALT1Phone)
Alt2ContactName	String *Optional*	Alternative contact name for business operations. (Old Attribute Name: ALT2Desc)
Alt2ContactPhoneNbr	String *Optional*	Alternative contact phone number for business operations. (Old Attribute Name: ALT2Phone)
Alt3ContactName	String *Optional*	Alternative contact name for business operations. (Old Attribute Name: ALT3Desc)
Alt3ContactPhoneNbr	String *Optional*	Alternative contact phone number for business operations. (Old Attribute Name: ALT3Phone)
AgentURL	String *Optional*	Tag Agent service URL for entity registration. (Old Attribute Name: Agent_URL)
AuthorityURL	String *Optional*	Tag Authority service URL for entity registration. (Old Attribute Name: Authority_URL)
ApprovalURL	String *Optional*	Tag Approval service URL for entity registration. (Old Attribute Name: Approval_URL)
ForwardURL	String *Optional*	Tag Forwarding service URL for entity registration. (Old Attribute Name: Forward_URL)

3.3.3 Method Specific Error Codes

3.3.4 Sample XML

```xml
<?xml version="1.0"?>
<soap:Envelope xmlns:soap=http://schemas.xmlsoap.org/soap/envelope/ xmlns:xsd=http://www.w3.org/2001/XMLSchema
xmlns:m0=http://www.oati.net/namespace/tvawtm/MRKT_WebServices>
        <soap:Body>
                <m:DownloadPSE xmlns:m="http://www.oati.net/namespace">
                        <m0:EffectiveDate>09/10/2010</m0:EffectiveDate>
                </m:DownloadPSE>
        </soap:Body>
</soap:Envelope>
```

3.3.5 Successful Response

```xml
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Body>
                <d1:DownloadPSEResponse xmlns:d1="http://www.oati.net/namespace">
                        <d2:OutputStruct xmlns:d2="http://www.oati.net/namespace/webRegistry/MRKT_WebServices">
                                <d2:ReturnCode>0</d2:ReturnCode>
                                <d2:ReturnCodeDesc>SUCCESS</d2:ReturnCodeDesc>
                                <d2:Success>
                                        <d2:PSEStruct>
                                                <d2:ID>12</d2:ID>
                                                <d2:TaggingEntityID>12</d2:TaggingEntityID>
                                                <d2:LongName>Long Name</d2:LongName>
                                                <d2:Code>Code</d2:Code>
                                                <d2:ShortName>Short Name</d2:ShortName>
                                                <d2:NERCID>12345</d2:NERCID>
                                                <d2:StartEffectiveDate>02/22/2010</d2:StartEffectiveDate>
                                                <d2:StopEffectiveDate>02/22/2010</d2:StopEffectiveDate>
                                                <d2:PSEType>RRO</d2:PSEType>
                                                <d2:ReliabilityRegionName>Region</d2:ReliabilityRegionName>
                                                <d2:AgentURL>AgentURL</d2:AgentURL>
                                                <d2:ForwardURL>ForwardURL</d2:ForwardURL>
                                                <d2:Hr24ContactName>Name</d2:Hr24ContactName>
                                                <d2:Hr24ContactPhoneNbr>612-208-4200</d2:Hr24ContactPhoneNbr>
                                                <d2:Hr24ContactFaxNbr>763-201-2000</d2:Hr24ContactFaxNbr>
                                        </d2:PSEStruct>
                                </d2:Success>
                        </d2:OutputStruct>
                </d1:DownloadPSEResponse>
        </soap:Body>
</soap:Envelope>
```

3.3.6 Failure Response

```xml
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Body>
                <d1:DownloadPSEResponse xmlns:d1="http://www.oati.net/namespace">
                        <d2:OutputStruct xmlns:d2="http://www.oati.net/namespace/webRegistry/MRKT_WebServices">
                                <d2:ReturnCode>1</d2:ReturnCode>
                                <d2:ReturnCodeDesc>FAILURE</d2:ReturnCodeDesc>
                                <d2:Error>
                                        <d2:ErrorStruct>
                                                <d2:ErrorCode>0</d2:ErrorCode>
                                                <d2:ErrorCodeDesc>String</d2:ErrorCodeDesc>
                                                <d2:ParentElementIndex>String</d2:ParentElementIndex>
                                        </d2:ErrorStruct>
                                        <d2:ErrorStruct>
                                                <d2:ErrorCode>0</d2:ErrorCode>
                                                <d2:ErrorCodeDesc>String</d2:ErrorCodeDesc>
                                                <d2:ParentElementIndex>String</d2:ParentElementIndex>
                                        </d2:ErrorStruct>
                                </d2:Error>
                        </d2:OutputStruct>
                </d1:DownloadPSEResponse>
        </soap:Body>
</soap:Envelope>
```

3.4 DownloadTSP

3.4.1 Description

OATI webRegistry allows for the retrieval of TSPs through the web service. The *DownloadTSP* method is accessible through the standard webRegistry web service mechanism. If Effective Date is not provided, this query will return the last published TSPs.

3.4.2 Parameters

3.4.2.1 Input Parameters

Element Name	Data Type/ Requirement	Description/ Notes
EffectiveDate	Date *Optional*	The effective date of the TSPs to be retrieved.
Version	String *Optional*	The version of the TSPs to be retrieved (i.e. ACTIVE, PENDING, FUTURE, or ARCHIVED).

3.4.2.2 Output Parameters

Element Name	Data Type/ Requirement	Description/ Notes
OutputStruct	Complex *Required*	Element that encapsulates the output elements.
ReturnCode	ReturnCode *Required*	The outcome of the processing of the method. 0 for SUCCESS and 1 for FAILURE. Since the payload can only have one EffectiveDate, FAILURE outcome means the retrieval cannot be processed successfully and SUCCESS outcome means the retrieval have been processed successfully.
ReturnCodeDesc	ReturnCodeDesc *Required*	The outcome of the processing of the method in string. The possible values are SUCCESS or FAILURE.
Error	Complex *Optional*	Element that encapsulates one or more ErrorStruct elements.
ErrorStruct	Complex *Required*	Element that encapsulates the error information.
ErrorCode	Integer *Required*	The error code based on the list provided in 'Method Specific Error Codes' section or in 'Generic Error Codes' section.
ErrorCodeDesc	String *Required*	The error code description based on the list provided in 'Method Specific Error Codes' section or in 'Generic Error Codes' section. In

Element Name	Data Type/ Requirement	Description/ Notes
		addition, additional error messages will be included as well if needed.
ErrorXPath	String *Optional*	Pointer/path to specific input that cannot be processed successfully.
Success	Complex *Optional*	Element that encapsulates one or more PSEStructs.
TSPStruct	Complex *Required*	Element that encapsulates elements defining attributes for one TSP.
ID	Integer *Required*	The unique system identifier associated to the object registration. (Old Attribute Name: N/A)
TaggingEntityID	Integer *Required*	The unique system identifier associated to the object registration. (Old Attribute Name: TaggingEntityID)
LongName	String *Required*	Full official/legal entity name. (Old Attribute Name: Entity_Name)
Code	String *Optional*	The entity code of the entity registration. (Old Attribute Name: Entity_Code)
ShortName	String *Required*	An abbreviated official/legal entity name. (Old Attribute Name: N/A)
NERCID	Integer *Optional*	Key that uniquely identifies a particular entity role/code within the current NERC registry. (Old Attribute Name: NERC_ID)
StartEffectiveDate	Date *Required*	The start date that delineate the time period of the entity registration. (Old Attribute Name: Begin_Date)
StopEffectiveDate	Date *Required*	The end date that delineate the time period of an entity registration. (Old Attribute Name: End_Date)
ReliabilityRegionName	String *Required*	Reliability Region name of entity registration. (Old Attribute Name: Region)
NHMBAMFlagStr	String *Optional*	Next Hour Market flag indicator. (Old Attribute Name: 0-NHMBAM_Flag)
MarketOperatorFlagStr	String *Optional*	Market Operator flag indicator. (Old Attribute Name:

Element Name	Data Type/ Requirement	Description/ Notes
		MarketOperatorFlag)
Hr24ContactName	String *Optional*	24 hour contact name for entity business operations. (Old Attribute Name: Contact24)
Hr24ContactPhoneNbr	String *Optional*	24 hour contact phone number for entity business operations. (Old Attribute Name: Phone24)
Hr24ContactFaxNbr	String *Optional*	24 hour contact fax number for entity business operations. (Old Attribute Name: Fax)
Alt1ContactName	String *Optional*	Alternative contact name for business operations. (Old Attribute Name: ALT1Desc)
Alt1ContactPhoneNbr	String *Optional*	Alternative contact phone number for business operations. (Old Attribute Name: ALT1Phone)
Alt2ContactName	String *Optional*	Alternative contact name for business operations. (Old Attribute Name: ALT2Desc)
Alt2ContactPhoneNbr	String *Optional*	Alternative contact phone number for business operations. (Old Attribute Name: ALT2Phone)
Alt3ContactName	String *Optional*	Alternative contact name for business operations. (Old Attribute Name: ALT3Desc)
Alt3ContactPhoneNbr	String *Optional*	Alternative contact phone number for business operations. (Old Attribute Name: ALT3Phone)
AgentURL	String *Optional*	Tag Agent service URL for entity registration. (Old Attribute Name: Agent_URL)
AuthorityURL	String *Optional*	Tag Authority service URL for entity registration. (Old Attribute Name: Authority_URL)
ApprovalURL	String *Optional*	Tag Approval service URL for entity registration. (Old Attribute Name: Approval_URL)
ForwardURL	String *Optional*	Tag Forwarding service URL for entity registration. (Old Attribute Name: Forward_URL)

3.4.3 Method Specific Error Codes

N/A.

3.4.4 Sample XML

```xml
<?xml version="1.0"?>
<soap:Envelope xmlns:soap=http://schemas.xmlsoap.org/soap/envelope/ xmlns:xsd=http://www.w3.org/2001/XMLSchema
xmlns:m0=http://www.oati.net/namespace/tvawtm/MRKT_WebServices>
        <soap:Body>
                <m:DownloadTSP xmlns:m="http://www.oati.net/namespace">
                        <m0:EffectiveDate>09/10/2010</m0:EffectiveDate>
                </m:DownloadTSP>
        </soap:Body>
</soap:Envelope>
```

3.4.5 Successful Response

```xml
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Body>
                <d1:DownloadTSPResponse xmlns:d1="http://www.oati.net/namespace">
                        <d2:OutputStruct xmlns:d2="http://www.oati.net/namespace/webRegistry/MRKT_WebServices">
                                <d2:ReturnCode>0</d2:ReturnCode>
                                <d2:ReturnCodeDesc>SUCCESS</d2:ReturnCodeDesc>
                                <d2:Success>
                                        <d2:TSPStruct>
                                                <d2:ID>12</d2:ID>
                                                <d2:TaggingEntityID>12</d2:TaggingEntityID>
                                                <d2:LongName>Long Name</d2:LongName>
                                                <d2:Code>Code</d2:Code>
                                                <d2:ShortName>Short Name</d2:ShortName>
                                                <d2:NERCID>12345</d2:NERCID>
                                                <d2:StartEffectiveDate>02/22/2010</d2:StartEffectiveDate>
                                                <d2:StopEffectiveDate>02/22/2010</d2:StopEffectiveDate>
                                                <d2:ReliabilityRegionName>Region</d2:ReliabilityRegionName>
                                                <d2:AgentURL>AgentURL</d2:AgentURL>
                                                <d2:ForwardURL>ForwardURL</d2:ForwardURL>
                                                <d2:Hr24ContactName>Name</d2:Hr24ContactName>
                                                <d2:Hr24ContactPhoneNbr>612-208-4200</d2:Hr24ContactPhoneNbr>
                                                <d2:Hr24ContactFaxNbr>763-201-2000</d2:Hr24ContactFaxNbr>
                                        </d2:TSPStruct>
                                </d2:Success>
                        </d2:OutputStruct>
                </d1:DownloadTSPResponse>
        </soap:Body>
</soap:Envelope>
```

3.4.6 Failure Response

```xml
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Body>
                <d1:DownloadTSPResponse xmlns:d1="http://www.oati.net/namespace">
                        <d2:OutputStruct xmlns:d2="http://www.oati.net/namespace/webRegistry/MRKT_WebServices">
                                <d2:ReturnCode>1</d2:ReturnCode>
                                <d2:ReturnCodeDesc>FAILURE</d2:ReturnCodeDesc>
                                <d2:Error>
                                        <d2:ErrorStruct>
                                                <d2:ErrorCode>0</d2:ErrorCode>
                                                <d2:ErrorCodeDesc>String</d2:ErrorCodeDesc>
                                                <d2:ParentElementIndex>String</d2:ParentElementIndex>
                                        </d2:ErrorStruct>
                                        <d2:ErrorStruct>
                                                <d2:ErrorCode>0</d2:ErrorCode>
                                                <d2:ErrorCodeDesc>String</d2:ErrorCodeDesc>
                                                <d2:ParentElementIndex>String</d2:ParentElementIndex>
                                        </d2:ErrorStruct>
                                </d2:Error>
                        </d2:OutputStruct>
                </d1:DownloadTSPResponse>
        </soap:Body>
</soap:Envelope>
```

3.5 DownloadRC

3.5.1 Description

OATI webRegistry allows for the retrieval of RCs through the web service. The *DownloadRC* method is accessible through the standard webRegistry web service mechanism. If Effective Date is not provided, this query will return the last published RCs.

3.5.2 Parameters

3.5.2.1 Input Parameters

Element Name	Data Type/ Requirement	Description/ Notes
EffectiveDate	Date *Optional*	The effective date of the RCs to be retrieved.
Version	String *Optional*	The version of the RCs to be retrieved (i.e. ACTIVE, PENDING, FUTURE, or ARCHIVED).

3.5.2.2 Output Parameters

Element Name	Data Type/ Requirement	Description/ Notes
OutputStruct	Complex *Required*	Element that encapsulates the output elements.
ReturnCode	ReturnCode *Required*	The outcome of the processing of the method. 0 for SUCCESS and 1 for FAILURE. Since the payload can only have one EffectiveDate, FAILURE outcome means the retrieval cannot be processed successfully and SUCCESS outcome means the retrieval have been processed successfully.
ReturnCodeDesc	ReturnCodeDesc *Required*	The outcome of the processing of the method in string. The possible values are SUCCESS or FAILURE.
Error	Complex *Optional*	Element that encapsulates one or more ErrorStruct elements.
ErrorStruct	Complex *Required*	Element that encapsulates the error information.
ErrorCode	Integer *Required*	The error code based on the list provided in 'Method Specific Error Codes' section or in 'Generic Error Codes' section.
ErrorCodeDesc	String *Required*	The error code description based on the list provided in 'Method Specific Error Codes' section or in 'Generic Error Codes' section. In

Element Name	Data Type/ Requirement	Description/ Notes
		addition, additional error messages will be included as well if needed.
ErrorXPath	String *Optional*	Pointer/path to specific input that cannot be processed successfully.
Success	Complex *Optional*	Element that encapsulates one or more RCStructs.
RCStruct	Complex *Required*	Element that encapsulates elements defining attributes for one RC.
ID	Integer *Required*	The unique system identifier associated to the object registration. (Old Attribute Name: N/A)
TaggingEntityID	Integer *Required*	The unique system identifier associated to the object registration. (Old Attribute Name: TaggingEntityID)
LongName	String *Required*	Full official/legal entity name. (Old Attribute Name: Entity_Name)
Code	String *Optional*	The entity code of the entity registration. (Old Attribute Name: Entity_Code)
ShortName	String *Required*	An abbreviated official/legal entity name. (Old Attribute Name: N/A)
NERCID	Integer *Optional*	Key that uniquely identifies a particular entity role/code within the current NERC registry. (Old Attribute Name: NERC_ID)
StartEffectiveDate	Date *Required*	The start date that delineate the time period of the entity registration. (Old Attribute Name: Begin_Date)
StopEffectiveDate	Date *Required*	The end date that delineate the time period of an entity registration. (Old Attribute Name: End_Date)
ReliabilityArea	String *Required*	Reliability Area name of the entity registration. (Old Attribute Name: N/A)
ReliabilityRegionName	String *Required*	Reliability Region name of entity registration. (Old Attribute Name: Region)
NHMBAMFlagStr	String *Optional*	Next Hour Market flag indicator. (Old Attribute Name: 0-

Element Name	Data Type/ Requirement	Description/ Notes
		NHMBAM_Flag)
MarketOperatorFlagStr	String *Optional*	Market Operator flag indicator. (Old Attribute Name: MarketOperatorFlag)
Hr24ContactName	String *Optional*	24 hour contact name for entity business operations. (Old Attribute Name: Contact24)
Hr24ContactPhoneNbr	String *Optional*	24 hour contact phone number for entity business operations. (Old Attribute Name: Phone24)
Hr24ContactFaxNbr	String *Optional*	24 hour contact fax number for entity business operations. (Old Attribute Name: Fax)
Alt1ContactName	String *Optional*	Alternative contact name for business operations. (Old Attribute Name: ALT1Desc)
Alt1ContactPhoneNbr	String *Optional*	Alternative contact phone number for business operations. (Old Attribute Name: ALT1Phone)
Alt2ContactName	String *Optional*	Alternative contact name for business operations. (Old Attribute Name: ALT2Desc)
Alt2ContactPhoneNbr	String *Optional*	Alternative contact phone number for business operations. (Old Attribute Name: ALT2Phone)
Alt3ContactName	String *Optional*	Alternative contact name for business operations. (Old Attribute Name: ALT3Desc)
Alt3ContactPhoneNbr	String *Optional*	Alternative contact phone number for business operations. (Old Attribute Name: ALT3Phone)
AgentURL	String *Optional*	Tag Agent service URL for entity registration. (Old Attribute Name: Agent_URL)
AuthorityURL	String *Optional*	Tag Authority service URL for entity registration. (Old Attribute Name: Authority_URL)
ApprovalURL	String *Optional*	Tag Approval service URL for entity registration. (Old Attribute Name: Approval_URL)
ForwardURL	String *Optional*	Tag Forwarding service URL for entity registration. (Old Attribute Name: Forward_URL)

3.5.3 Method Specific Error Codes

N/A.

3.5.4 Sample XML

```xml
<?xml version="1.0"?>
<soap:Envelope xmlns:soap=http://schemas.xmlsoap.org/soap/envelope/ xmlns:xsd=http://www.w3.org/2001/XMLSchema
xmlns:m0=http://www.oati.net/namespace/tvawtm/MRKT_WebServices>
        <soap:Body>
                <m:DownloadRC xmlns:m="http://www.oati.net/namespace">
                        <m0:EffectiveDate>09/10/2010</m0:EffectiveDate>
                </m:DownloadRC>
        </soap:Body>
</soap:Envelope>
```

3.5.5 Successful Response

```xml
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Body>
                <d1:DownloadRCResponse xmlns:d1="http://www.oati.net/namespace">
                        <d2:OutputStruct xmlns:d2="http://www.oati.net/namespace/webRegistry/MRKT_WebServices">
                                <d2:ReturnCode>0</d2:ReturnCode>
                                <d2:ReturnCodeDesc>SUCCESS</d2:ReturnCodeDesc>
                                <d2:Success>
                                        <d2:RCStruct>
                                                <d2:ID>12</d2:ID>
                                                <d2:TaggingEntityID>12</d2:TaggingEntityID>
                                                <d2:LongName>Long Name</d2:LongName>
                                                <d2:Code>Code</d2:Code>
                                                <d2:ShortName>Short Name</d2:ShortName>
                                                <d2:NERCID>12345</d2:NERCID>
                                                <d2:StartEffectiveDate>02/22/2010</d2:StartEffectiveDate>
                                                <d2:StopEffectiveDate>02/22/2010</d2:StopEffectiveDate>
                                                <d2:ReliabilityArea>RRO</d2:ReliabilityArea>
                                                <d2:ReliabilityRegionName>Region</d2:ReliabilityRegionName>
                                                <d2:AgentURL>AgentURL</d2:AgentURL>
                                                <d2:ForwardURL>ForwardURL</d2:ForwardURL>
                                                <d2:Hr24ContactName>Name</d2:Hr24ContactName>
                                                <d2:Hr24ContactPhoneNbr>612-208-4200</d2:Hr24ContactPhoneNbr>
                                                <d2:Hr24ContactFaxNbr>763-201-2000</d2:Hr24ContactFaxNbr>
                                        </d2:RCStruct>
                                </d2:Success>
                        </d2:OutputStruct>
                </d1:DownloadRCResponse>
        </soap:Body>
</soap:Envelope>
```

3.5.6 Failure Response

```xml
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Body>
                <d1:DownloadRCResponse xmlns:d1="http://www.oati.net/namespace">
                        <d2:OutputStruct xmlns:d2="http://www.oati.net/namespace/webRegistry/MRKT_WebServices">
                                <d2:ReturnCode>1</d2:ReturnCode>
                                <d2:ReturnCodeDesc>FAILURE</d2:ReturnCodeDesc>
                                <d2:Error>
                                        <d2:ErrorStruct>
                                                <d2:ErrorCode>0</d2:ErrorCode>
                                                <d2:ErrorCodeDesc>String</d2:ErrorCodeDesc>
                                                <d2:ParentElementIndex>String</d2:ParentElementIndex>
                                        </d2:ErrorStruct>
                                        <d2:ErrorStruct>
                                                <d2:ErrorCode>0</d2:ErrorCode>
                                                <d2:ErrorCodeDesc>String</d2:ErrorCodeDesc>
                                                <d2:ParentElementIndex>String</d2:ParentElementIndex>
                                        </d2:ErrorStruct>
                                </d2:Error>
                        </d2:OutputStruct>
                </d1:DownloadRCResponse>
        </soap:Body>
</soap:Envelope>
```

3.6 DownloadPORPOD

3.6.1 Description

OATI webRegistry allows for the retrieval of POR and POD points through the web service. The *DownloadPORPOD* method is accessible through the standard webRegistry web service mechanism. If Effective Date is not provided, this query will return the last published POR and POD points.

3.6.2 Parameters

3.6.2.1 Input Parameters

Element Name	Data Type/ Requirement	Description/ Notes
EffectiveDate	Date *Optional*	The effective date of the POR/PODs to be retrieved.
Version	String *Optional*	The version of the POR/PODs to be retrieved (i.e., ACTIVE, PENDING, FUTURE, or ARCHIVED).

3.6.2.2 Output Parameters

Element Name	Data Type/ Requirement	Description/ Notes
OutputStruct	Complex *Required*	Element that encapsulates the output elements.
ReturnCode	ReturnCode *Required*	The outcome of the processing of the method. 0 for SUCCESS and 1 for FAILURE. Since the payload can only have one EffectiveDate, FAILURE outcome means the retrieval cannot be processed successfully and SUCCESS outcome means the retrieval have been processed successfully.
ReturnCodeDesc	ReturnCodeDesc *Required*	The outcome of the processing of the method in string. The possible values are SUCCESS or FAILURE.
Error	Complex *Optional*	Element that encapsulates one or more ErrorStruct elements.
ErrorStruct	Complex *Required*	Element that encapsulates the error information.
ErrorCode	Integer *Required*	The error code based on the list provided in 'Method Specific Error Codes' section or in 'Generic Error Codes' section.
ErrorCodeDesc	String *Required*	The error code description based on the list provided in 'Method Specific Error Codes' section or in

Element Name	Data Type/ Requirement	Description/ Notes
		'Generic Error Codes' section. In addition, additional error messages will be included as well if needed.
ErrorXPath	String *Optional*	Pointer/path to specific input that cannot be processed successfully.
Success	Complex *Optional*	Element that encapsulates one or more PORPODStructs.
PORPODStruct	Complex *Required*	Element that encapsulates elements defining attributes for one POR/POD.
ID	Integer *Required*	The unique system identifier associated to the object registration. (Old Attribute Name: N/A)
TaggingPointID	Integer *Required*	The unique system identifier associated to the object registration. (Old Attribute Name: TaggingPointID)
NERCID	Integer *Optional*	Key that uniquely identifies a particular entity role/code within the current NERC registry. (Old Attribute Name: NERC_ID)
Name	String *Required*	Name of transmission service point. (Old Attribute Name: PointName)
TSPName	String *Optional*	The Transmission Service Provider owner of the service point. (Old Attribute Name: TP_Entity_ID)
BAName	String *Required*	The Balancing Area of the service point. (Old Attribute Name: CA_Entity_ID)
PointTypeName	PointTypeName *Required*	The transmission service point type. (Old Attribute Name: PORPODRoleID)
StartEffectiveDate	Date *Required*	The start date that delineate the time period of the object registration. (Old Attribute Name: CreationDate)
StopEffectiveDate	Date *Required*	The end date that delineate the time period of an object registration. (Old Attribute Name:

Element Name	Data Type/ Requirement	Description/ Notes
		DeactivationDate)

3.6.3 Method Specific Error Codes

N/A.

3.6.4 Sample XML

```
<?xml version="1.0"?>
<soap:Envelope xmlns:soap=http://schemas.xmlsoap.org/soap/envelope/ xmlns:xsd=http://www.w3.org/2001/XMLSchema
xmlns:m0=http://www.oati.net/namespace/tvawtm/MRKT_WebServices>
        <soap:Body>
                <m:DownloadPORPOD xmlns:m="http://www.oati.net/namespace">
                        <m0:EffectiveDate>09/10/2010</m0:EffectiveDate>
                </m:DownloadPORPOD>
        </soap:Body>
</soap:Envelope>
```

3.6.5 Successful Response

```
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Body>
                <d1:DownloadPORPODResponse xmlns:d1="http://www.oati.net/namespace">
                        <d2:OutputStruct xmlns:d2="http://www.oati.net/namespace/webRegistry/MRKT_WebServices">
                                <d2:ReturnCode>0</d2:ReturnCode>
                                <d2:ReturnCodeDesc>SUCCESS</d2:ReturnCodeDesc>
                                <d2:Success>
                                        <d2:PORPODStruct>
                                                <d2:ID>12</d2:ID>
                                                <d2:TaggingPointID>12</d2:TaggingPointID>
                                                <d2:NERCID>12345</d2:NERCID>
                                                <d2:Name> Name</d2:Name>
                                                <d2:TSPName>TSPName</d2:TSPName>
                                                <d2:BAName>BA  Name</d2:BAName>
                                                <d2:PointTypeName>Both</d2:PointTypeName>
                                                <d2:StartEffectiveDate>02/22/2010</d2:StartEffectiveDate>
                                                <d2:StopEffectiveDate>02/22/2010</d2:StopEffectiveDate>
                                        </d2:PORPODStruct>
                                </d2:Success>
                        </d2:OutputStruct>
                </d1:DownloadPORPODResponse>
        </soap:Body>
</soap:Envelope>
```

3.6.6 Failure Response

```
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Body>
                <d1:DownloadPORPODResponse xmlns:d1="http://www.oati.net/namespace">
                        <d2:OutputStruct xmlns:d2="http://www.oati.net/namespace/webRegistry/MRKT_WebServices">
                                <d2:ReturnCode>1</d2:ReturnCode>
                                <d2:ReturnCodeDesc>FAILURE</d2:ReturnCodeDesc>
                                <d2:Error>
                                        <d2:ErrorStruct>
                                                <d2:ErrorCode>0</d2:ErrorCode>
                                                <d2:ErrorCodeDesc>String</d2:ErrorCodeDesc>
                                                <d2:ParentElementIndex>String</d2:ParentElementIndex>
                                        </d2:ErrorStruct>
                                        <d2:ErrorStruct>
                                                <d2:ErrorCode>0</d2:ErrorCode>
                                                <d2:ErrorCodeDesc>String</d2:ErrorCodeDesc>
                                                <d2:ParentElementIndex>String</d2:ParentElementIndex>
                                        </d2:ErrorStruct>
                                </d2:Error>
                        </d2:OutputStruct>
                </d1:DownloadPORPODResponse>
        </soap:Body>
</soap:Envelope>
```

3.7 DownloadSourceSink

3.7.1 Description

OATI webRegistry allows for the retrieval of Source and Sink points through the web service. The *DownloadSourceSink* method is accessible through the standard webRegistry web service mechanism. If Effective Date is not provided, this query will return the last published Source and Sink points.

3.7.2 Parameters

3.7.2.1 Input Parameters

Element Name	Data Type/ Requirement	Description/ Notes
EffectiveDate	Date *Optional*	The effective date of the Source/Sinks to be retrieved.
Version	String *Optional*	The version of the Source/Sinks to be retrieved (i.e. ACTIVE, PENDING, FUTURE, or ARCHIVED).

3.7.2.2 Output Parameters

Element Name	Data Type/ Requirement	Description/ Notes
OutputStruct	Complex *Required*	Element that encapsulates the output elements.
ReturnCode	ReturnCode *Required*	The outcome of the processing of the method. 0 for SUCCESS and 1 for FAILURE. Since the payload can only have one EffectiveDate, FAILURE outcome means the retrieval cannot be processed successfully and SUCCESS outcome means the retrieval have been processed successfully.
ReturnCodeDesc	ReturnCodeDesc *Required*	The outcome of the processing of the method in string. The possible values are SUCCESS or FAILURE.
Error	Complex *Optional*	Element that encapsulates one or more ErrorStruct elements.
ErrorStruct	Complex *Required*	Element that encapsulates the error information.
ErrorCode	Integer *Required*	The error code based on the list provided in 'Method Specific Error Codes' section or in 'Generic Error Codes' section.
ErrorCodeDesc	String *Required*	The error code description based on the list provided in 'Method Specific Error Codes' section or in

Element Name	Data Type/ Requirement	Description/ Notes
		'Generic Error Codes' section. In addition, additional error messages will be included as well if needed.
ErrorXPath	String Optional	Pointer/path to specific input that cannot be processed successfully.
Success	Complex Optional	Element that encapsulates one or more SourceSinkStructs.
SourceSinkStruct	Complex Required	Element that encapsulates elements defining attributes for one Source/Sink.
ID	Integer Required	The unique system identifier associated to the object registration. (Old Attribute Name: N/A)
TaggingPointID	Integer Required	The unique system identifier associated to the object registration. (Old Attribute Name: TaggingPointID)
NERCID	Integer Optional	Key that uniquely identifies a particular entity role/code within the current NERC registry. (Old Attribute Name: NERC_ID)
Name	String Required	The name of the point object registration. (Old Attribute Name: PointName)
BAName	String Required	The hosting Balancing Authority name of the object registration. (Old Attribute Name: HostCATaggingID)
ControlZoneName	String Required	The hosting control zone name of the point. (Old Attribute Name: N/A)
PSEName	String Optional	Name of PSE owners of the point. (Old Attribute Name: GPELSETaggingEntityID)
PointTypeName	PointTypeName Required	The point type of the object registration. (Old Attribute Name: SourceSinkRoleID)
MRDResourceID	Integer Optional	Market Redispatch Resource identifier of the object registration. (Old Attribute Name: MRDResourceID)
StartEffectiveDate	Date Required	The start date that delineate the time period of the object

Element Name	Data Type/ Requirement	Description/ Notes
		registration. (Old Attribute Name: CreationDate)
StopEffectiveDate	Date *Required*	The end date that delineate the time period of an object registration. (Old Attribute Name: DeactivationDate)

3.7.3 Method Specific Error Codes

N/A.

3.7.4 Sample XML

```
<?xml version="1.0"?>
<soap:Envelope xmlns:soap=http://schemas.xmlsoap.org/soap/envelope/ xmlns:xsd=http://www.w3.org/2001/XMLSchema
xmlns:m0=http://www.oati.net/namespace/tvawtm/MRKT_WebServices>
        <soap:Body>
                <m:DownloadSourceSink xmlns:m="http://www.oati.net/namespace">
                        <m0:EffectiveDate>09/10/2010</m0:EffectiveDate>
                </m:DownloadSourceSink>
        </soap:Body>
</soap:Envelope>
```

3.7.5 Successful Response

```
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Body>
                <d1:DownloadPORPODResponse xmlns:d1="http://www.oati.net/namespace">
                        <d2:OutputStruct xmlns:d2="http://www.oati.net/namespace/webRegistry/MRKT_WebServices">
                                <d2:ReturnCode>0</d2:ReturnCode>
                                <d2:ReturnCodeDesc>SUCCESS</d2:ReturnCodeDesc>
                                <d2:Success>
                                        <d2:SourceSinkStruct>
                                                <d2:ID>12</d2:ID>
                                                <d2:TaggingPointID>12</d2:TaggingPointID>
                                                <d2:NERCID>12345</d2:NERCID>
                                                <d2:Name> Name</d2:Name>
                                                <d2:BAName>BA  Name</d2:BAName>
                                                <d2:ControlZoneName>Control Zone</d2:ControlZoneName>
                                                <d2:PSEName>PSEName</d2:PSEName>
                                                <d2:PointTypeName>Both</d2:PointTypeName>
                                                <d2:StartEffectiveDate>02/22/2010</d2:StartEffectiveDate>
                                                <d2:StopEffectiveDate>02/22/2010</d2:StopEffectiveDate>
                                        </d2:SourceSinkStruct>
                                </d2:Success>
                        </d2:OutputStruct>
                </d1:DownloadPORPODResponse>
        </soap:Body>
</soap:Envelope>
```

3.7.6 Failure Response

```
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Body>
                <d1:DownloadPORPODResponse xmlns:d1="http://www.oati.net/namespace">
                        <d2:OutputStruct xmlns:d2="http://www.oati.net/namespace/webRegistry/MRKT_WebServices">
                                <d2:ReturnCode>1</d2:ReturnCode>
                                <d2:ReturnCodeDesc>FAILURE</d2:ReturnCodeDesc>
                                <d2:Error>
                                        <d2:ErrorStruct>
                                                <d2:ErrorCode>0</d2:ErrorCode>
                                                <d2:ErrorCodeDesc>String</d2:ErrorCodeDesc>
                                                <d2:ParentElementIndex>String</d2:ParentElementIndex>
```

```xml
                                </d2:ErrorStruct>
                                <d2:ErrorStruct>
                                            <d2:ErrorCode>0</d2:ErrorCode>
                                            <d2:ErrorCodeDesc>String</d2:ErrorCodeDesc>
                                            <d2:ParentElementIndex>String</d2:ParentElementIndex>
                                </d2:ErrorStruct>
                            </d2:Error>
                    </d2:OutputStruct>
                </d1:DownloadPORPODResponse>
        </soap:Body>
</soap:Envelope>
```

4. Notification webRegistry Web Service Methods

4.1 PublicationEvent

4.1.1 Description

OATI webRegistry notifies subscribers when a publication has been made through web service that anybody can subscribe to by providing a compliant listener.

4.1.2 Parameters

4.1.2.1 Input Parameters

Element Name	Data Type/ Requirement	Description/ Notes
PubVersionID	Integer *Required*	Internal webRegistry publication version ID.
EffectiveDate	Date *Required*	The effective date of the publication.
PublicationType	PubType *Required*	Type of the publication (i.e. I = Immediate, S = Scheduled).

4.1.2.2 Output Parameters

Element Name	Data Type/ Requirement	Description/ Notes
OutputStruct	Complex *Required*	Element that encapsulates the output elements.
ReturnCode	ReturnCode *Required*	The outcome of the processing of the method. 0 for SUCCESS and 1 for FAILURE. FAILURE outcome means the publication information cannot be received successfully and SUCCESS outcome means publication information have been received successfully.
ReturnCodeDesc	ReturnCodeDesc *Required*	The outcome of the processing of the method in string. The possible values are SUCCESS or FAILURE.

4.1.3 Method Specific Error Codes

N/A.

4.1.4 Sample XML

```
<?xml version="1.0"?>
<soap:Envelope xmlns:soap=http://schemas.xmlsoap.org/soap/envelope/ xmlns:xsd=http://www.w3.org/2001/XMLSchema
xmlns:m0=http://www.oati.net/namespace/tvawtm/MRKT_WebServices>
        <soap:Body>
                <m:PublicationEvent xmlns:m="http://www.oati.net/namespace">
                        <m0:PubVersionID>12</m0:PubVersionID>
                        <m0:EffectiveDate>09/20/2011</m0:EffectiveDate>
```

```xml
                    <m0:PublicationType>S</m0:PublicationType>
                </m:PublicationEvent>
        </soap:Body>
</soap:Envelope>
```

4.1.5 Successful Response

```xml
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Body>
                <d1:PublicationEventResponse xmlns:d1="http://www.oati.net/namespace">
                        <d2:OutputStruct xmlns:d2="http://www.oati.net/namespace/webRegistry/MRKT_WebServices">
                                <d2:ReturnCode>0</d2:ReturnCode>
                                <d2:ReturnCodeDesc>SUCCESS</d2:ReturnCodeDesc>
                        </d2:OutputStruct>
                </d1:PublicationEventResponse>
        </soap:Body>
</soap:Envelope>
```

4.1.6 Failure Response

```xml
<?xml version="1.0"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/" xmlns:xsd="http://www.w3.org/2001/XMLSchema">
        <soap:Body>
                <d1:PublicationEventResponse xmlns:d1="http://www.oati.net/namespace">
                        <d2:OutputStruct xmlns:d2="http://www.oati.net/namespace/webRegistry/MRKT_WebServices">
                                <d2:ReturnCode>1</d2:ReturnCode>
                                <d2:ReturnCodeDesc>FAILURE</d2:ReturnCodeDesc>
                        </d2:OutputStruct>
                </d1:PublicationEventResponse>
        </soap:Body>
</soap:Envelope>
```

Specific Data Type Definitions

Data Type Name	Base Type	Description/ Notes
EntityCodeRole	String	Enumerations with possible values of the list of Roles (e.g., BA, TSP, etc.).
PointTypeName	String	Enumerations with possible values of POR, POD, Source, Sink, or Both.
Date	String	Only positive integers are allowed (i.e., regular expression pattern of [0-1][0-9]/[0-3][0-9]/[0-9][0-9][0-9][0-9]).
ReturnCode	String	Only 1 or 0 is allowed (i.e., regular expression pattern of [0-1]). 1 = FAILURE; 0 = SUCCESS.
ReturnCodeDesc	String	Enumerations with possible values of SUCCESS or FAILURE.

5. FTP Mechanism

webRegistry allows for the retrieval of objects through File Transfer Protocol (FTP) to support existing systems and carry continuity through the initial transition process between the TSIN registry and OATI webRegistry. Here, you can only download the current or pending versions of webRegistry publications in MDB and CSV file formats.

The URL of the webRegistry FTP site is: ftp://ftp.naesbwry.oati.com

Publications are tentatively set to be made available on the webRegistry FTP site beginning May 14, 2012.

To obtain username and password required to access the FTP site, please contact support@oati.com.

The file structure of the webRegistry FTP site will match the existing file structure of the TSIN Registry FTP site. For example, the active registry MDB file is located at /registry/Active/Full_Registry.mdb.

6. Generic Error Codes

100 – Invalid Date

105 – Invalid Version

110 – Effective Date must be specified if you are downloading Future or Archived publication

115 – No objects can be found that matches the specified criteria

900 – Schema Validation Error

990 – Another Instance of the method is currently running

995 – Internal Error

Filename: webRegistry Technical Guide v1.1 JR 030212