



A Tale of 2 Utilities: A Case Study of MultiSpeak® Integrations for Utilities

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Code GS2843

Learning Objectives

At the end of this class, you will be able to:

- Describe how College Station integrated their systems with Milsoft using MultiSpeak
- Explain how Welland Hydro integrated their outage management system with Autodesk® Infrastructure Map Server and AutoCAD Map 3D
- Identify the possibilities of integrating various systems using MultiSpeak
- Make better use of your Autodesk software and suites with other existing systems

About the Speaker

Frank has over twenty years' experience in the information technology industry, serving as a software developer, trainer, architect and leader, and more than 15 years of IT consulting to utilities and municipal governments. Frank has a proven record of success in managing and implementing solutions that model and maintain utility infrastructure, support the design process, streamline business processes and integrate diverse systems.

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MultiSpeak Interface 2.0

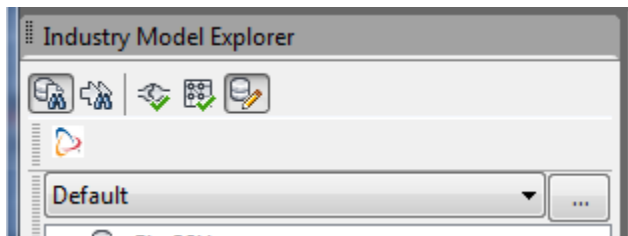
Overview

This document describes the MultiSpeak Interface 2.0 that works with AutoCAD Map 3D 2013 and supports both Enterprise and File Based Industry Model. The interface is configurable to support custom industry models. The interface produces a MultiSpeak 3.0 batch xml file for use to import into the Milsoft WindMil product.

Installation

There are setup programs for 32bit and 64bit installations of AutoCAD Map 3D 2013. The setup installs a document plug-in for use with AutoCAD Map 3D 2013 industry models. The document plug-in files are installed in the bin folder of your AutoCAD Map 3D 2013 installation folder. In addition, the install will prompt you to enter a separate application folder location for supporting files.

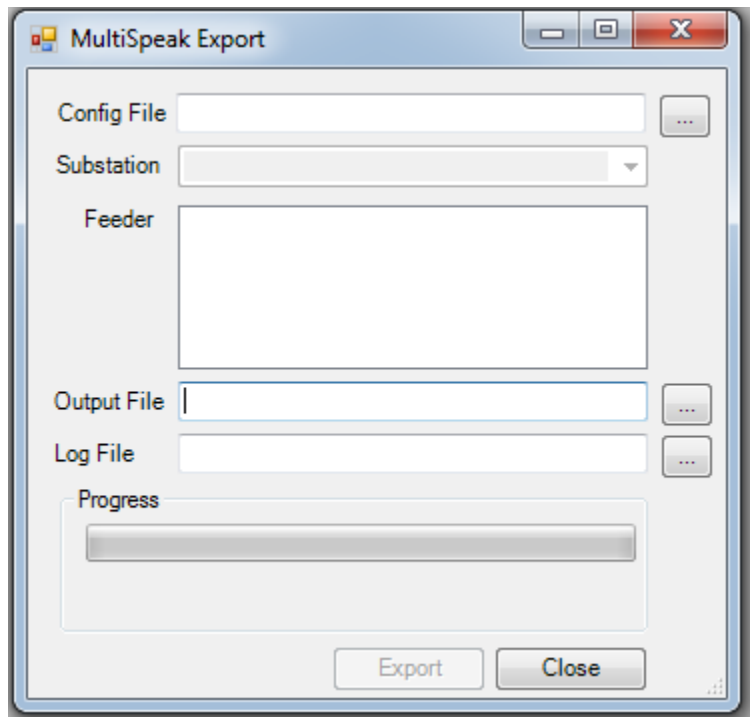
After a successful installation you will see a toolbar, below the main Industry Model toolbar, with the MultiSpeak icon after opening an industry model as shown:



The following sections describe the usage of the interface and how to configure the interface for your needs.

User Guide

When you click on the MultiSpeak button the interface main dialog is shown:



The interface consists of the following components:

- Config File** The Config File is an XML file that defines the mapping from your Industry Model objects to MultiSpeak objects. The configuration file format is discussed in the following section of this document.

- Substation** The Substation drop down menu lists all the Substations in the model. Once a Substation is selected the list of feeders associated with the selected Substation are listed in the Feeder list box below it.

- Feeder** The feeders for the selected Substation are displayed. One or more feeders can be selected to export.

- Output File** The output file is the path to the resultant MultiSpeak xml file.

- Log File** The path to the log file produced during the export process.

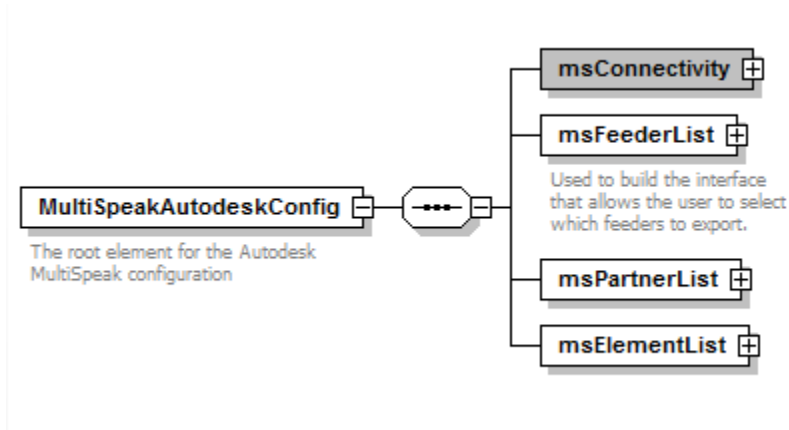
- Progress** This is the progress indicator during the export operation.

- Export** Once all the required fields are populated the Export button is enabled.

- Close** Close the dialog.

MultiSpeak Configuration File

The MultiSpeak configuration file is an xml file that is used to define the mappings from you Industry Model schema to MultiSpeak objects as defined in the MultiSpeak Version 3.0 specification (www.multispeak.org). The xml schema for the configuration file is defined in the file MultiSpeakAutodeskConfig.xsd which can be found in the support\config directory where the interface support files were installed. Also in this directory is a sample configuration file for the NA electric industry model, ttelectricconfig.xml. This directory also contains a sample configuration file for the default Electric Industry model. The top level elements of the schema are shown below:



This is the corresponding section in a sample xml file.

```

<?xml version="1.0" encoding="UTF-8"?>
<!--Sample XML file generated by XMLSpy v2012 sp1 (x64) (http://www.altova.com)-->
<MultiSpeakAutodeskConfig xsi:schemaLocation="http://www.autodesk.com/MultiSpeakAutodeskConfig
MultiSpeakAutodeskConfig.xsd" xmlns="http://www.autodesk.com/MultiSpeakAutodeskConfig" xmlns:xsi=
"http://www.w3.org/2001/XMLSchema-instance">
  <msConnectivity name="ELECTRIC_CONN" fromId="FID_FROM" fromClassId="F_CLASS_ID_FROM" toId=
"FID_TO" toClassId="F_CLASS_ID_TO" />
  <msFeederList name="V_MSPK_CIRCUIT_LIST" substation="SUBSTATION" feeder="CIRCUIT" />
  <msPartnerList>
  <msElementList>
</MultiSpeakAutodeskConfig>

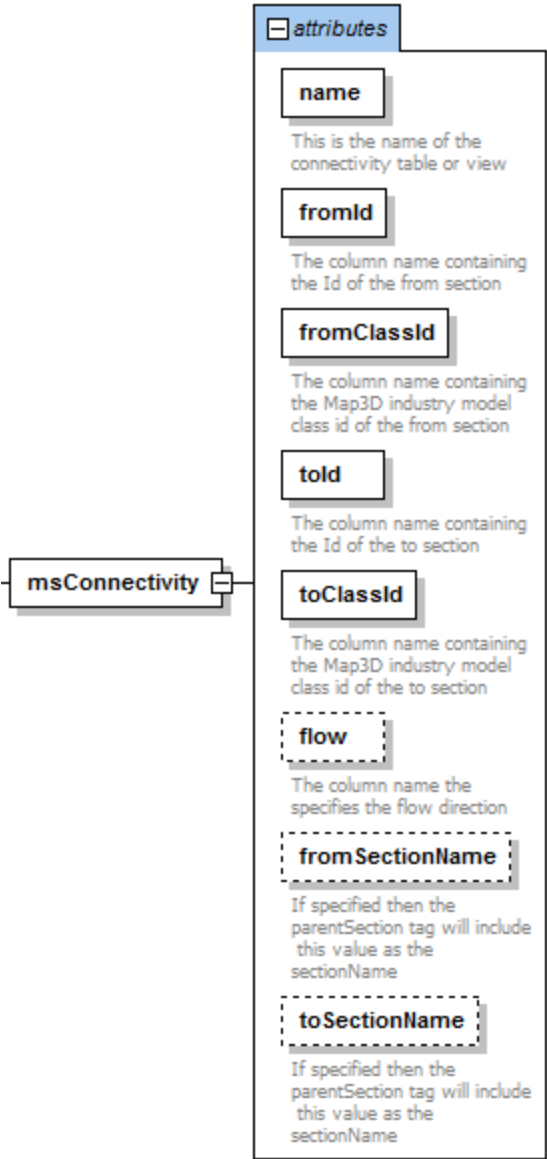
```

MultiSpeakAutodeskConfig

This is the root element of the file.

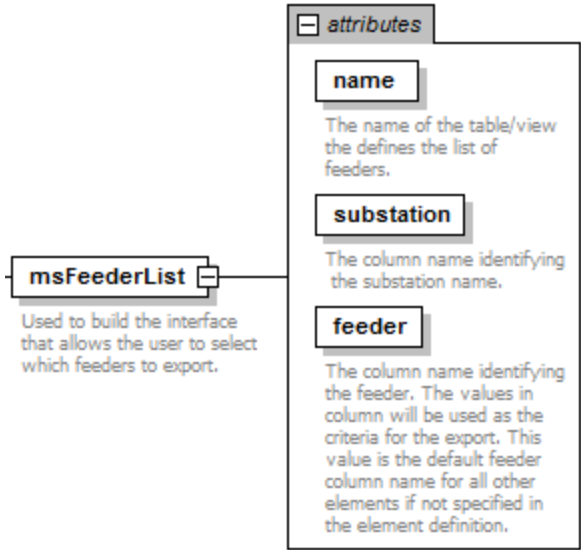
msConnectivity

This element specifies how connectivity is maintained in the Industry Model. This is used to describe the standard Industry Model utility connectivity model. It is possible to override the use of the utility model in which case the parentSection attribute of the msElement object must be specified (see the msElement section for more information). The following diagram shows the attributes for the msConnectivity element.



msFeederList

This element specifies how to determine the substations and their corresponding feeders. This element is used by the user interface to build the substation drop down menu and the feeder list. The following diagram shows the list of attributes required:

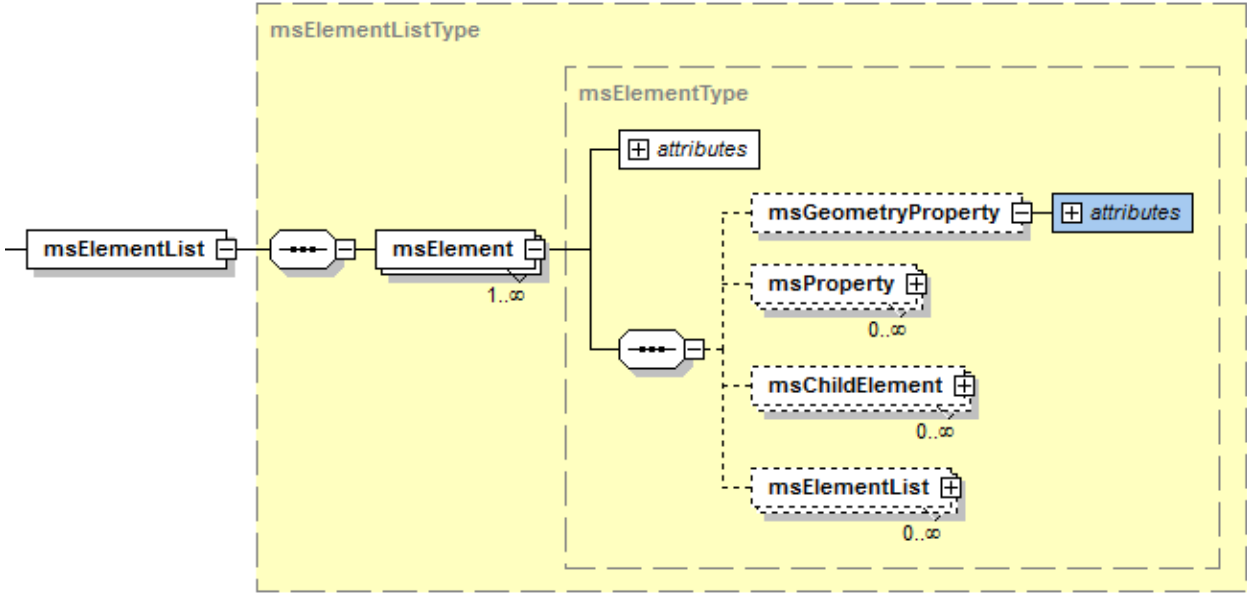


msPartnerList

This has been deprecated and is no longer used.

msElementList

The msElementList is a list of msElements and an msElement is a mapping definition from an Industry Model object to a MultiSpeak object as shown:

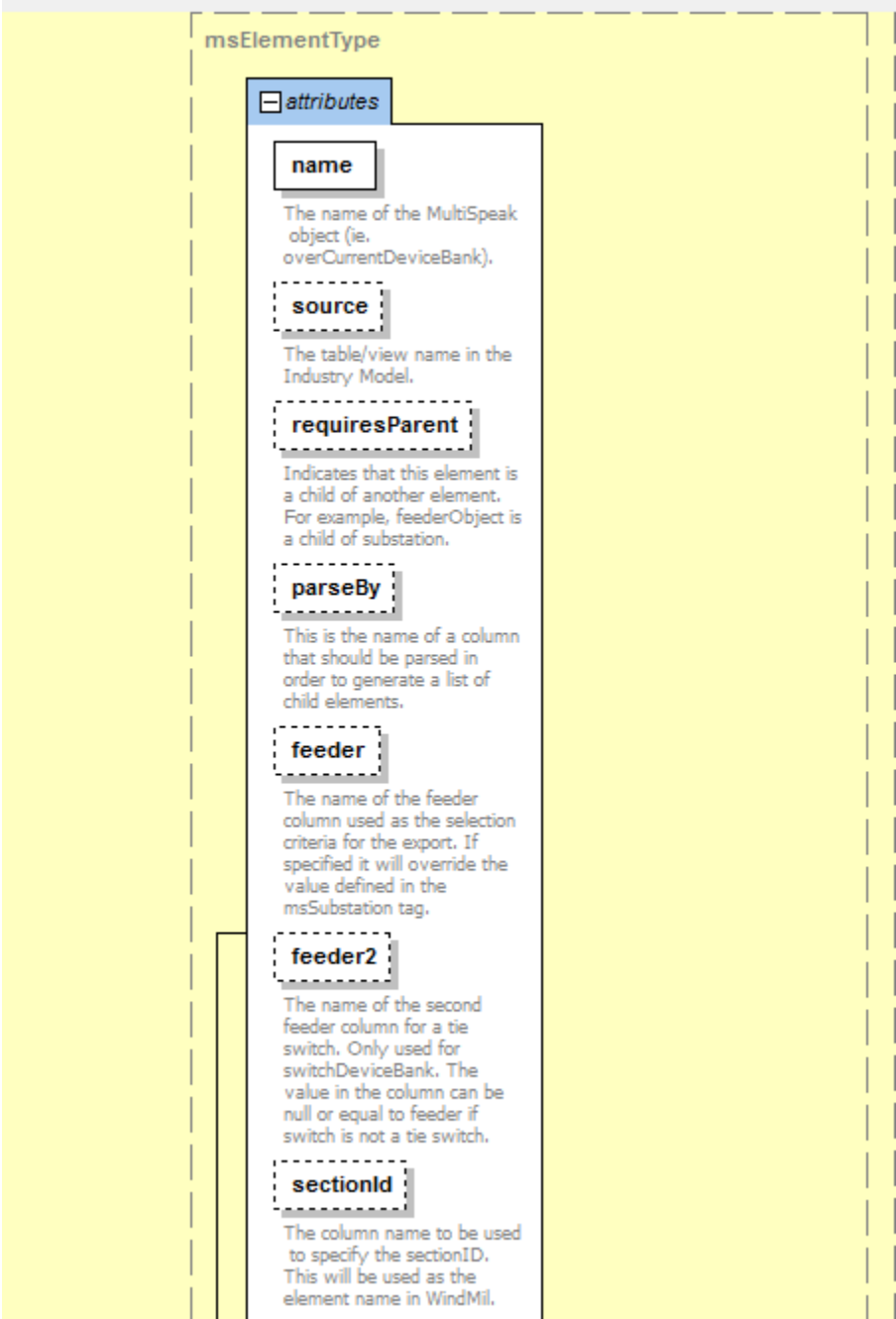


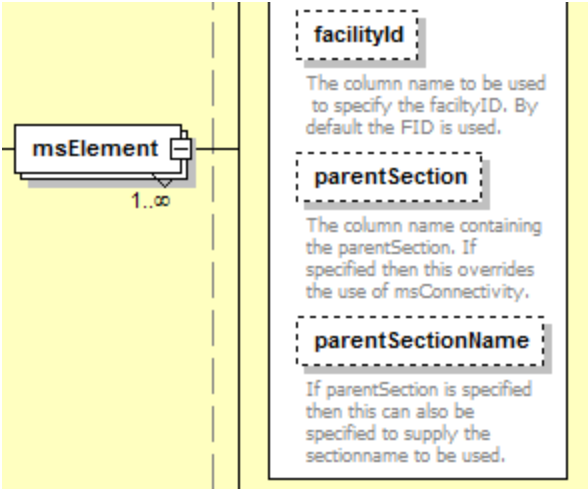
Shown below is a sample msElementList section:

```
<msElementList>
  <msElement name="substation" source="EL SUBSTATION" feeder="NAME NUMBER" >
  <msElement name="feederObject" source="V MSPK CIRCUIT LIST" requiresParent="true" >
  <msElement name="overcurrentDeviceBank" source="V MSPK EL BREAKER" feeder="CIRCUIT"
parentSection="PARENT_SECTION" >
  <msElement name="overcurrentDeviceBank" source="V MSPK EL FUSE" feeder="CIRCUIT" >
  <msElement name="overcurrentDeviceBank" source="V MSPK EL RECLOSER" feeder="CIRCUIT" >
  <msElement name="switchDeviceBank" source="V MSPK EL SWITCH" feeder="CIRCUIT" >
  <msElement name="transformerBank" source="V MSPK EL TRANSFORMER" feeder="CIRCUIT" >
  <msElement name="fakeNodeSection" source="V MSPK EL JUNCTION" feeder="CIRCUIT" >
  <msElement name="fakeNodeSection" source="V MSPK EL METER" feeder="CIRCUIT" >
  <msElement name="serviceLocation" source="V MSPK EL SERVICE POINT" feeder="CIRCUIT" >
  <msElement name="ugPrimaryLine" source="V MSPK PRIMARY UG" feeder="CIRCUIT" >
  <msElement name="ugSecondaryLine" source="V MSPK SECONDARY UG" feeder="CIRCUIT" >
  <msElement name="ohPrimaryLine" source="V MSPK PRIMARY OH" feeder="CIRCUIT" >
  <msElement name="ohSecondaryLine" source="V MSPK SECONDARY OH" feeder="CIRCUIT" >
</msElementList>
</MultiSpeakAutodeskConfig>
```

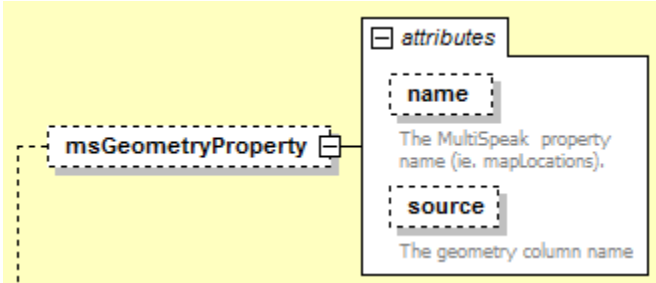

msElement

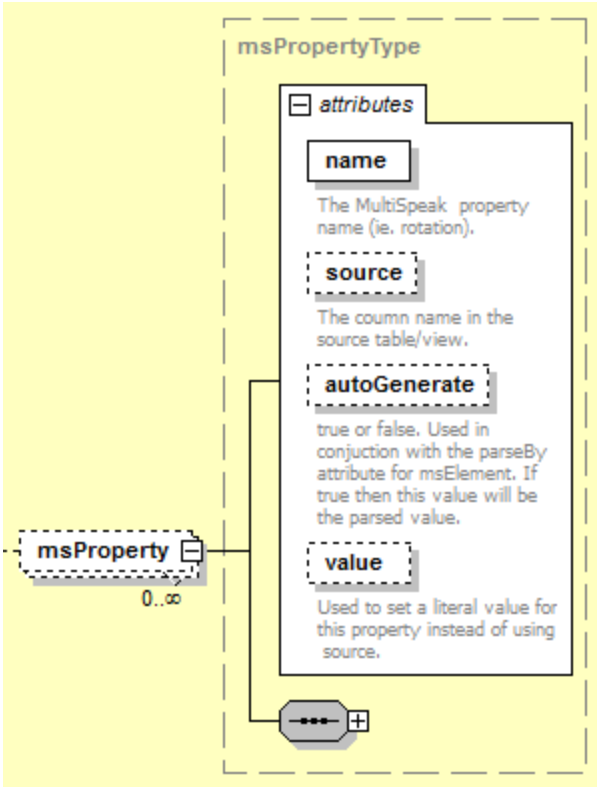
The following diagram shows the attributes for msElement:



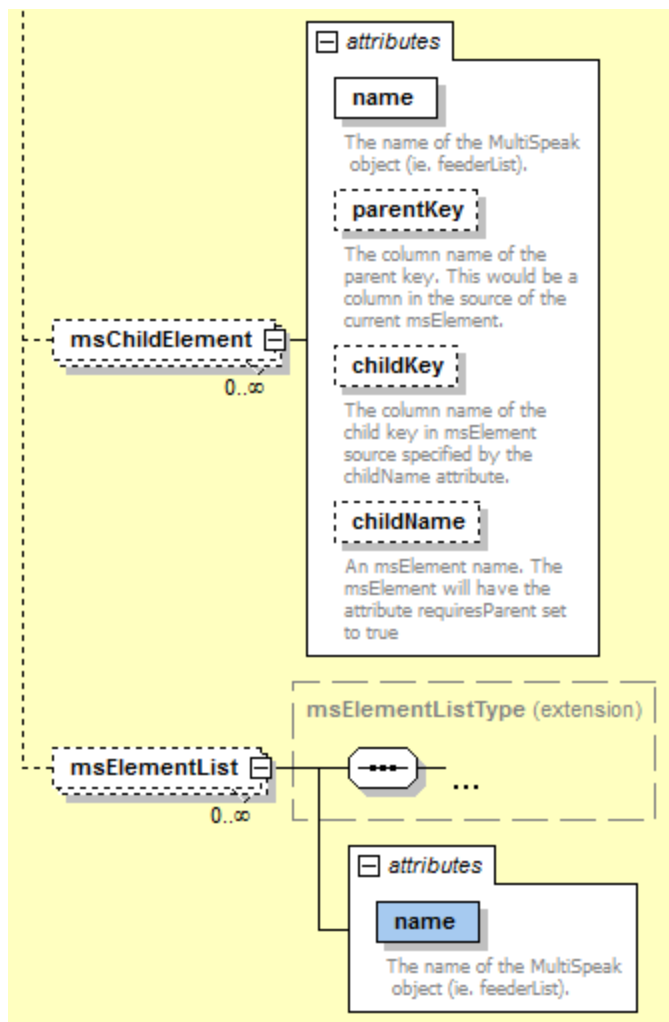


The following diagrams the remaining elements:





The following two diagram show two ways in which child MultiSpeak elements can be specified. The first, msChildElement, allows you to specify a reference to another msElement element in the configuration file. The second allows you to embed a child msElementList within the current element:



The following example shows an `msElement` using an `msChildElement`:

```

<msElementList>
  <msElement name="substation" source="EL_SUBSTATION" feeder="NAME_NUMBER" >
    <msGeometryProperty name="mapLocation" source="GEOM"/>
    <msProperty name="rotation" source="ORIENTATION" />
    <msProperty name="rotationSpecified" value="true" />
    <msProperty name="phaseCode" value="ABC" />
    <msProperty name="phaseCodeSpecified" value="true" />
    <msProperty name="utility" value="BrockwellIT" />
    <msProperty name="name" source="NAME_NUMBER" />
    <msChildElement name="feederList" childName="feederObject" parentKey="NAME_NUMBER" childKey=
"SUBSTATION" />
  </msElement>
  <msElement name="feederObject" source="V_MSPK_CIRCUIT_LIST" requiresParent="true" >
    <msProperty name="substationName" source="SUBSTATION" />
    <msProperty name="feederName" source="CIRCUIT" />
    <msProperty name="feederNo" source="CIRCUIT" />
  </msElement>
</msElementList>

```

The following example shows an msElement with a child list specified as an embedded msElementList. Also the child list has autogenerated values by parsing the Phase column:

```
<msElement name="switchDeviceBank" source="V_MSPK_EL_SWITCH" feeder="CIRCUIT" >
  <msGeometryProperty name="mapLocation" source="GEOM"/>
  <msProperty name="rotation" source="ORIENTATION" />
  <msProperty name="rotationSpecified" value="true" />
  <msProperty name="phaseCode" source="PHASE" />
  <msProperty name="phaseCodeSpecified" value="true" />
  <msProperty name="utility" value="BrockwellIT" />
  <msElementList name="mspSwitchDeviceList">
    <msElement name="mspSwitchingDevice" parseBy="PHASE">
      <msProperty name="phase" autoGenerate="true" />
      <msProperty name="phaseSpecified" value="true" />
      <msProperty name="position" source="STATE" />
    </msElement>
  </msElementList>
</msElement>
```

Application Views/Configuration

The source attribute for msElement specifies the table or view from which the source data is retrieved. The table or view has the following requirements.

- FID column that represents the industry model feature identifier.
- A column that identifies the Feeder or Circuit. The feeder attribute in msElement specifies the column name or if omitted the column name is identified by the feeder attribute in the msFeederList element.
- The data returned must return correct data in the correct format or type as expected by the MultiSpeak specification and Windmil as there are no implicit transformations performed on the data.

The “support\sql” directory where the interface support files are installed contain the sql scripts used to create the views for the NA Electric industry model. There is one script for enterprise industry model using oracle and there is one script for the file based industry model. These scripts create the views that are reference by the corresponding configuration file in the “support\config” directory.

If the tables or views specified in the configuration file do not exist in the model then the interface will attempt to create them. The MultiSpeak.Map3DDataAccess.dll.config file, located in the bin directory of the AutoCad Map3D install is used to define the location and name of the sql files as shown below:

```
<?xml version="1.0" encoding="utf-8" ?>  
<configuration>  
  <appSettings>  
    <add key="SQLConfigFiles" value="C:\Program Files\Autodesk\MultiSpeak\support\sql" />  
    <add key="MultiSpeakViewsOracle" value="ttelelectric_ora.sql" />  
    <add key="MultiSpeakViewsSQLite" value="ttelelectric_sqlite.sql" />  
  </appSettings>  
</configuration>
```

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