

{B48D85A3-F5F5-11CF-9D89-0080C72E70A3}
{B48D85A4-F5F5-11CF-9D89-0080C72E70A3}
{89738623-F1C3-11CF-9D89-0080C72E70A3}
{8973860F-F1C3-11CF-9D89-0080C72E70A3}
{89738618-F1C3-11CF-9D89-0080C72E70A3}
{62F28191-F9C4-11CF-9D89-0080C72E70A3}
{62F28190-F9C4-11CF-9D89-0080C72E70A3}
{62F2818E-F9C4-11CF-9D89-0080C72E70A3}
{62F2818F-F9C4-11CF-9D89-0080C72E70A3}
{62F28192-F9C4-11CF-9D89-0080C72E70A3}
{62F2818D-F9C4-11CF-9D89-0080C72E70A3}
{B48D858F-F5F5-11CF-9D89-0080C72E70A3}
{B48D858D-F5F5-11CF-9D89-0080C72E70A3}

IEEE P1159.3 PQDIF Task Force Meeting

Dan Sabin

Electrotek Concepts, Inc.

d.sabin@ieee.org

January 11, 2010

Lake Buena Vista, Florida, USA



IEEE Std 1159.3 Task Force

IEEE

IEEE Power & Energy Society

- IEEE Transmission and Distribution Committee
 - IEEE Power Quality Subcommittee
 - IEEE P1159 Working Group on Power Quality Monitoring
 - IEEE P1159.3 Task Force on Power Quality Data Interchange

IEEE Std 1159.3 PQDIF History

- The IEEE P1159.3 Task Force was formed in 1996 by the IEEE P1159 Working Group
- The first version of the standard was completed in 2002 and affirmed by vote in 2003
- A reaffirmation was completed in March 2009.

What Next for IEEE P1159.3?

Proposed 2010 Work

- Complete editorial corrections to 2002 document
- Add new ID and GUID lookup values
- Add new annex on storing PQDIF records in XML
- Solicit feedback from vendors using PQDIF

Proposed 2011-2012 Work

- Add new annex on storing PQDIF records in a relational database

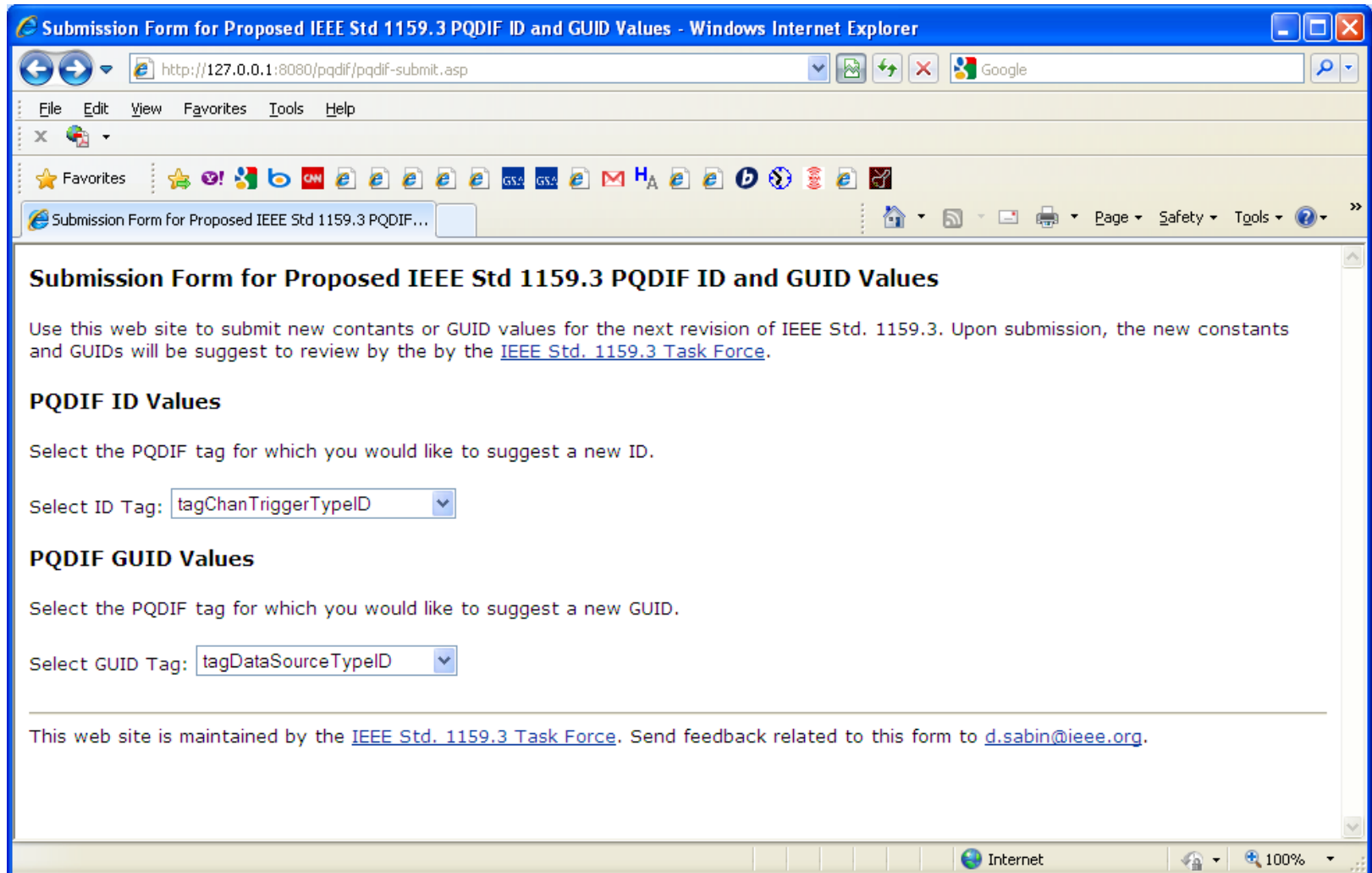
Example 4-Byte Integer ID Values

- tagPhaseID
 - ID_PHASE_AN, ID_PHASE_BN, ID_PHASE_CN, etc.
- tagQuantityMeasuredID
 - ID_QM_ENERGY, D_QM_MFIELD, ID_QM_CURRENT, etc.
- tagQuantityUnitsID
 - ID_QU_AMPS, ID_QU_PERUNIT, ID_QU_RPM, etc.

Example 32-Byte GUID ID Values

- tagVendorID, tagEquipmentID
- tagQuantityCharacteristicID
 - ID_QC_Q_FUND, ID_QC_DF, ID_QC_RMS, etc.
- tagDisturbanceCategoryID
 - ID_DISTURB_1159_SHORTDUR_MOMENT, ID_DISTURB_1159_SHORTDUR, etc.
- tagQuantityTypeID
 - ID_QT_WAVEFORM, ID_QT_PHASOR, ID_QT_MAGDUR, etc.

New Web Site for Submitting New Tags and IDs



Suggested Approach

1. Use web site to request new ID values from PQDIF users
2. Use task force meetings to approve submitted ID values into next draft.
3. Use web site to distribute next draft.
4. Repeat Steps 1 to 3 several times, and then see if we are ready to ballot a new version of IEEE 1159.3 with the new ID values.

Example of Dictionary File for the Proposed XML Format

```
<?xml version="1.0" ?>
- <Dictionary>
- <Standard>
- <tags>
  <Blank value="{89738618-F1C3-11CF-9D89-0080C72E70A3}" />
  <Container value="{89738606-F1C3-11CF-9D89-0080C72E70A3}" />
  <RecDataSource value="{89738619-F1C3-11CF-9D89-0080C72E70A3}" />
  <RecMonitorSettings value="{B48D858C-F5F5-11CF-9D89-0080C72E70A3}" />
  <RecObservation value="{8973861A-F1C3-11CF-9D89-0080C72E70A3}" />
  <VersionInfo value="{89738607-F1C3-11CF-9D89-0080C72E70A3}" />
  <FileName value="{89738608-F1C3-11CF-9D89-0080C72E70A3}" />
  <Creation value="{89738609-F1C3-11CF-9D89-0080C72E70A3}" />
  <LastSaved value="{8973860A-F1C3-11CF-9D89-0080C72E70A3}" />
  <TimesSaved value="{8973860B-F1C3-11CF-9D89-0080C72E70A3}" />
  <Language value="{8973860C-F1C3-11CF-9D89-0080C72E70A3}" />
  <Title value="{8973860D-F1C3-11CF-9D89-0080C72E70A3}" />
  <Subject value="{8973860E-F1C3-11CF-9D89-0080C72E70A3}" />
  <Author value="{8973860F-F1C3-11CF-9D89-0080C72E70A3}" />
  <Keywords value="{89738610-F1C3-11CF-9D89-0080C72E70A3}" />
  <Comments value="{89738611-F1C3-11CF-9D89-0080C72E70A3}" />
  <LastSavedBy value="{89738612-F1C3-11CF-9D89-0080C72E70A3}" />
  <Application value="{89738623-F1C3-11CF-9D89-0080C72E70A3}" />
  <Security value="{89738613-F1C3-11CF-9D89-0080C72E70A3}" />
  <Owner value="{89738614-F1C3-11CF-9D89-0080C72E70A3}" />
  <Copyright value="{89738615-F1C3-11CF-9D89-0080C72E70A3}" />
  <Trademarks value="{89738616-F1C3-11CF-9D89-0080C72E70A3}" />
  <Notes value="{89738617-F1C3-11CF-9D89-0080C72E70A3}" />
  <CompressionStyleID value="{8973861B-F1C3-11CF-9D89-0080C72E70A3}" />
  <CompressionAlgorithmID value="{8973861C-F1C3-11CF-9D89-0080C72E70A3}" />
  <CompressionChecksum value="{8973861D-F1C3-11CF-9D89-0080C72E70A3}" />
  <Name value="{B48D85A2-F5F5-11CF-9D89-0080C72E70A3}" />
  <Address1 value="{B48D85A3-F5F5-11CF-9D89-0080C72E70A3}" />
```

Example of Proposed XML Format

```
<?xml version="1.0" ?>
- <records>
- <tagContainer>
- <tagVersionInfo VT="UINT4" ET="V" NP="4">
  <d>1 5 1 5</d>
</tagVersionInfo>
<tagFileName VT="CHAR1" ET="T">C:\projects\EPRI P001.005-2007\PQDIF Examples\Value Log of Voltage THD
  for Three Phases.xml</tagFileName>
<tagCreation VT="DT">2008-02-18T21:36:33.468750</tagCreation>
<tagLastSaved VT="DT">2008-02-18T21:36:33.468750</tagLastSaved>
<tagTimesSaved VT="UINT4">1</tagTimesSaved>
<tagLanguage VT="CHAR1" ET="T">US English</tagLanguage>
<tagTitle VT="CHAR1" ET="T">PQView</tagTitle>
<tagSubject VT="CHAR1" ET="T">N/A</tagSubject>
<tagAuthor VT="CHAR1" ET="T">dsabin</tagAuthor>
<tagKeywords VT="CHAR1" ET="T">N/A</tagKeywords>
<tagComments VT="CHAR1" ET="T">Exported from ODBC;DATABASE=PQVIEW_DEMO</tagComments>
<tagLastSavedBy VT="CHAR1" ET="T">dsabin</tagLastSavedBy>
<tagApplication VT="CHAR1" ET="T">PQView Power Quality Data Manager</tagApplication>
<tagSecurity VT="CHAR1" ET="T">No Security</tagSecurity>
<tagOwner VT="CHAR1" ET="T">N/A</tagOwner>
<tagCopyright VT="CHAR1" ET="T">N/A</tagCopyright>
<tagTrademarks VT="CHAR1" ET="T">PQView is a registered trademark of Electrotek Concepts, Inc. EPRI is a
  registered service mark of the Electric Power Research Institute.</tagTrademarks>
<tagNotes VT="CHAR1" ET="T">N/A</tagNotes>
<tagName VT="CHAR1" ET="T">PQView</tagName>
<tagAddress1 VT="CHAR1" ET="T">3420 Hillview Avenue</tagAddress1>
<tagCity VT="CHAR1" ET="T">Palo Alto</tagCity>
<tagState VT="CHAR1" ET="T">CA</tagState>
<tagPostalCode VT="CHAR1" ET="T">94304</tagPostalCode>
<tagCountry VT="CHAR1" ET="T">USA</tagCountry>
<tagPhoneVoice VT="CHAR1" ET="T">+1-650-855-2121</tagPhoneVoice>
```

Example of Proposed XML Format

```
<tagStorageMethodID VT="UINT4">ID_SERIES_METHOD_VALUES</tagStorageMethodID>
</tagSeriesDefns>
</tagOneChannelDefn>
- <tagOneChannelDefn>
  <tagChannelName VT="CHAR1" ET="T">V THD BC</tagChannelName>
  <tagPhaseID VT="UINT4">ID_PHASE_BC</tagPhaseID>
  <tagQuantityTypeID VT="GUID">ID_QT_VALUELOG</tagQuantityTypeID>
  <tagQuantityMeasuredID VT="UINT4">ID_QM_VOLTAGE</tagQuantityMeasuredID>
  - <tagSeriesDefns>
    <tagValueTypeID VT="GUID">ID_SERIES_VALUE_TYPE_TIME</tagValueTypeID>
    <tagQuantityUnitsID VT="UINT4">ID_QU_SECONDS</tagQuantityUnitsID>
    <tagQuantityCharacteristicID VT="GUID">ID_QC_INSTANTANEOUS</tagQuantityCharacteristicID>
    <tagStorageMethodID VT="UINT4">ID_SERIES_METHOD_VALUES</tagStorageMethodID>
  </tagSeriesDefns>
  - <tagSeriesDefns>
    <tagValueTypeID VT="GUID">ID_SERIES_VALUE_TYPE_VAL</tagValueTypeID>
    <tagQuantityUnitsID VT="UINT4">ID_QU_NONE</tagQuantityUnitsID>
    <tagQuantityCharacteristicID VT="GUID">ID_QC_TOTAL_THD</tagQuantityCharacteristicID>
    <tagStorageMethodID VT="UINT4">ID_SERIES_METHOD_VALUES</tagStorageMethodID>
  </tagSeriesDefns>
</tagOneChannelDefn>
- <tagOneChannelDefn>
  <tagChannelName VT="CHAR1" ET="T">V THD CA</tagChannelName>
  <tagPhaseID VT="UINT4">ID_PHASE_CA</tagPhaseID>
  <tagQuantityTypeID VT="GUID">ID_QT_VALUELOG</tagQuantityTypeID>
  <tagQuantityMeasuredID VT="UINT4">ID_QM_VOLTAGE</tagQuantityMeasuredID>
  - <tagSeriesDefns>
    <tagValueTypeID VT="GUID">ID_SERIES_VALUE_TYPE_TIME</tagValueTypeID>
    <tagQuantityUnitsID VT="UINT4">ID_QU_SECONDS</tagQuantityUnitsID>
    <tagQuantityCharacteristicID VT="GUID">ID_QC_INSTANTANEOUS</tagQuantityCharacteristicID>
    <tagStorageMethodID VT="UINT4">ID_SERIES_METHOD_VALUES</tagStorageMethodID>
  </tagSeriesDefns>
  - <tagSeriesDefns>
```

Implementing PQDIF in XML Files

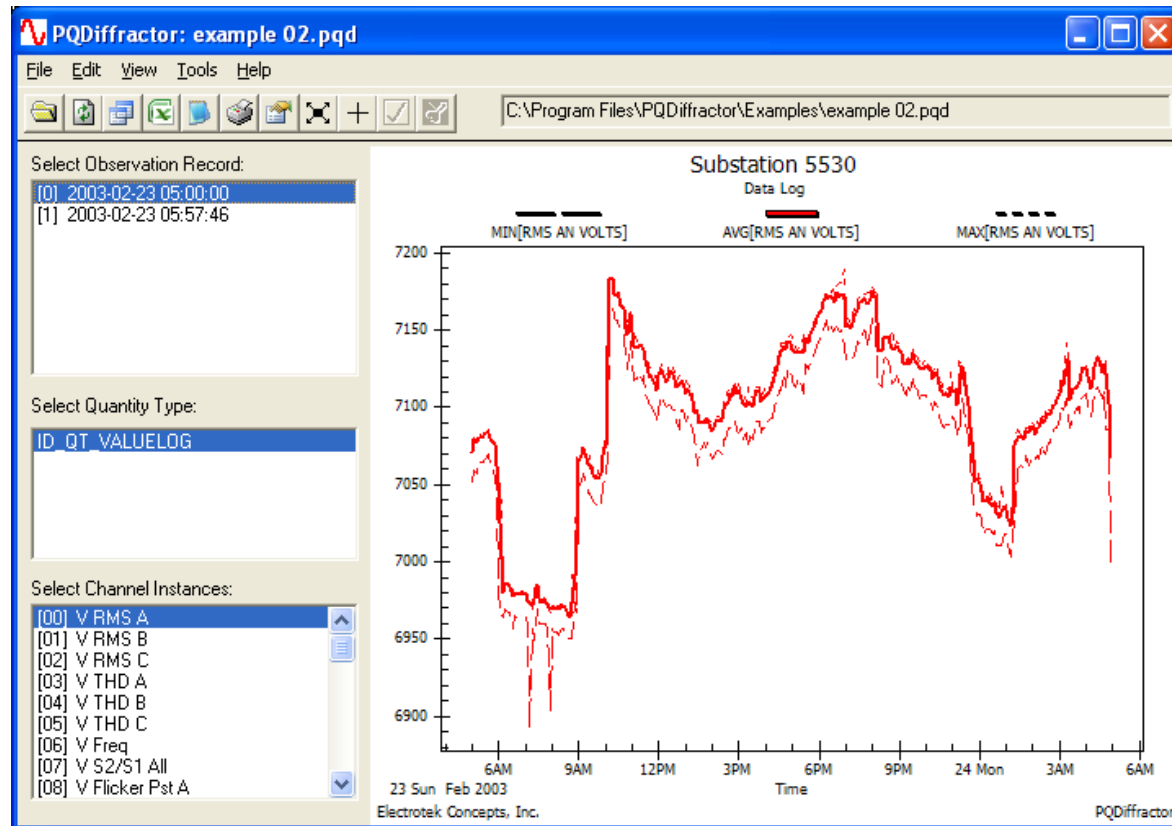
- The IEEE task force has worked on an XML specification for storing PQDIF files since 2004.
- The advantages to this format include easier reading and writing, compatibility with arbitrary XML applications, and the ability to provide documentation and examples of proper file structure to other software engineers.
- The disadvantage to this format is increased file size (~10x) and processing time due to text parsing.
 - File size can be reduced by compressing the XML file (for example, zip or rar)

New PQDIF Resources on Internet

- <http://www.pqview.com/pqdif/>
 - Example PQDIF Files
 - Zip archive contains example of PQDIF files in the native binary (PQD) format
 - Example PQDIF XML Files
 - Zip archive contains example of PQDIF files in the proposed XML format
 - PQDiffractor
 - A free PQDIF file viewer and diagnostics utility

PQDiffactor

- PQDiffactor is a free PQDIF file viewer utility developed for browsing, diagnosing, and converting PQDIF files.



PQDiffactor Functions

- Read binary PQDIF Files
- View lists of data source records in each PQDIF file
- View list of observation records stored in each PQDIF file
- View lists of quantity types associated with each observation record
- View list of channel instances associated in each observation record
- View tags and values from records, definitions, and instances stored in PQDIF files as tables

PQDiffraction Export Functions

- Export charts to numerous graphical formats
 - Enhanced metafile (EMF)
 - Windows metafile (WMF)
 - Windows bitmap (BMP)
 - JPEG Image (JPG)
 - Portable Network Graphics (PNG)
- Export displayed observations as text files
 - Direct export to Microsoft Excel
 - Export as CSV file

PQDiffraction Conversion Functions

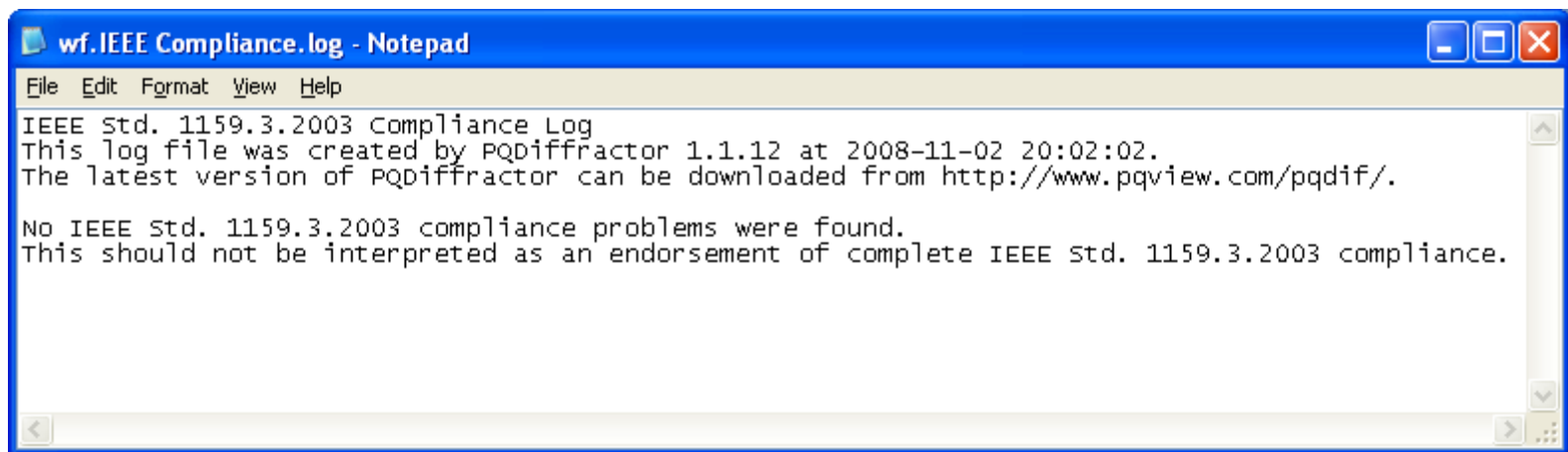
- Convert from native binary PQD to XML
- Convert from native binary PQD to XML Structure

PQDiffractor Utility Functions

- Delete one or more observation records
- Delete one or more channel instances

More PQDiffactor Tool Strip Commands

- Opens the IEEE 1159.3 Compliance Log Text file if created by using the menu command **Tools|Log IEEE Compliance** when the file was read.



PQDiffraction Availability and Installation

- The latest version of PQDiffraction can be downloaded from the following PQView web sites:
 - www.pqview.com
 - www.pqview.net
- PQDiffraction is redistributable and has been downloaded by about thirty different companies since November 2008.

PQDiffraction Downloads

- Downloaded by more about thirty different companies
- Building mailing list for new task force members