IEEE P1159.3 PQDIF Task Force Meeting

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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 or revision and its vote was due in October 2008.
IEEE Std 1159.3 PQDIF Reaffirmation

• We initiated a reaffirmation ballot in September 2008.
• The ballot was open from October 15 to November 14
• Ballot Pool Size: 65
  – Number of Votes: 54
    • Accept: 52
    • Reject: 0
    • Abstain: 2
• The reaffirmation was completed at the March 2008 meeting of the Standards Board.
What Next for IEEE P1159.3?

Proposed 2009-2010 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 GUIDID 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
Example of Dictionary File for the Proposed XML Format
Example of Proposed XML Format
Example of Proposed XML Format

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

  - 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.
PQDiffra ctor 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
PQDiffractor 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 PQDiffractor 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.

```
IEEE Std. 1159.3.2003 Compliance Log
This log file was created by PQDiffractor 1.1.12 at 2008-11-02 20:02:02.
The latest version of PQDiffractor can be downloaded from http://www.pqview.com/pqdiff/.

No IEEE Std. 1159.3.2003 compliance problems were found.
This should not be interpreted as an endorsement of complete IEEE Std. 1159.3.2003 compliance.
```
PQDiffractor Availability and Installation

• The latest version of PQDiffractor can be downloaded from the following PQView web sites:
  – www.pqview.com
  – www.pqview.net

• PQDiffractor is redistributable and has been downloaded by about thirty different companies since last November
PQDiffractor Downloads

- Downloaded by more than twenty different companies
- Building mailing list for new task force members