

{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

July 26, 2010

Minneapolis, Minnesota, 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's Next for IEEE P1159.3?

Proposed 2010-2012 Work

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

Proposed 2013-2014 Work

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

Web Site Updated

IEEE 1159.3 PQDIF Task Force - Windows Internet Explorer

http://grouper.ieee.org/groups/1159/3/

File Edit View Favorites Tools Help

Find: ID_phase Previous Next Options

IEEE 1159.3 PQDIF Task Force

The IEEE 1159.3 Task Force maintains and develops *IEEE Std 1159.3 Recommended Practice for the Transfer of Power Quality Data*.

Task Force Officers

Chair	Secretary
Dan Sabin Electrotek Concepts 900 Cummings Center, Suite 408U Beverly, Massachusetts, 01915 USA E-Mail: Dan Sabin	Rich Bingham Dranetz-BMI 1000 New Durham Road Edison, NJ 08818 USA E-Mail: Rich Bingham

Project Scope

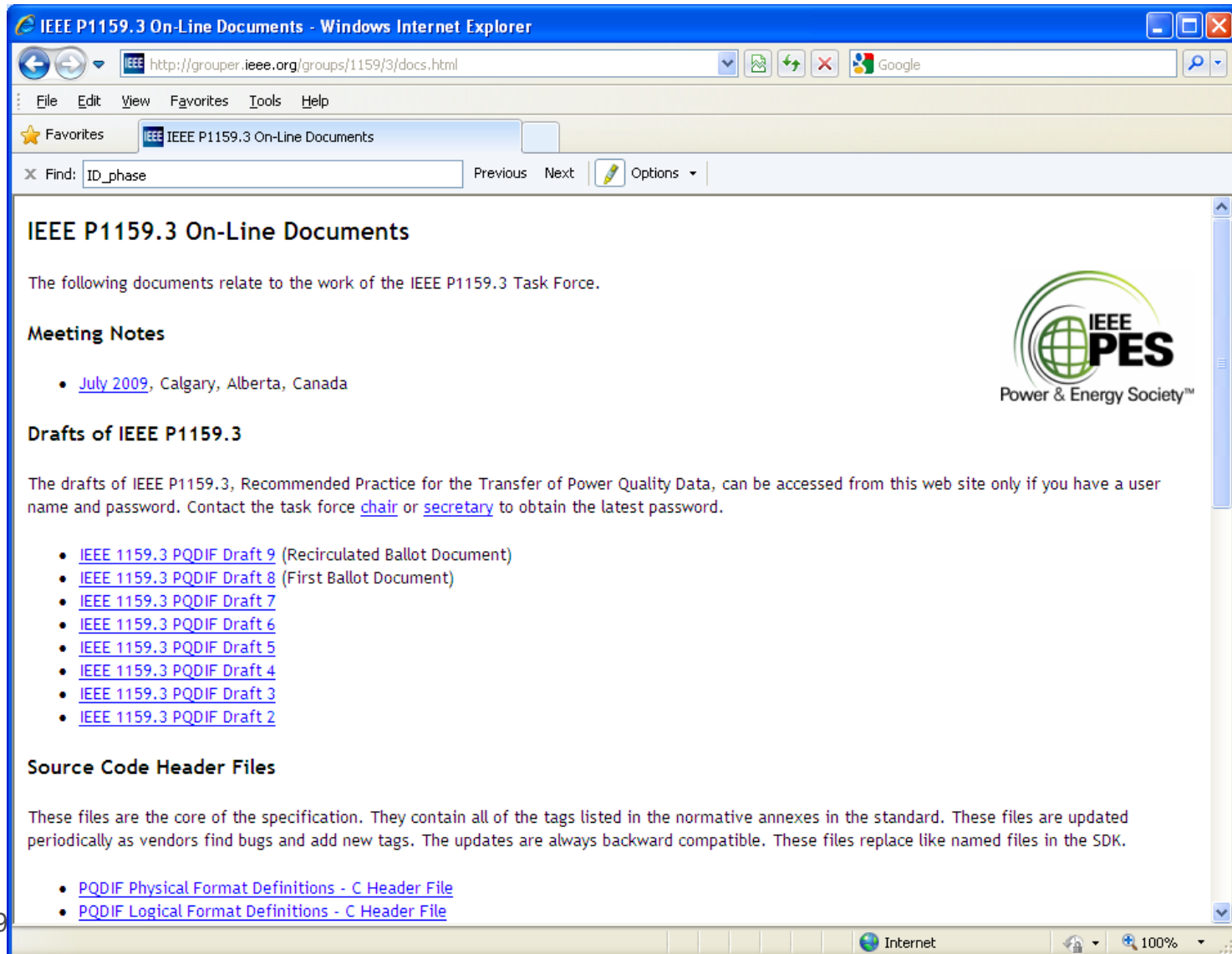
Develop a recommended practice for a file format suitable for exchanging power quality-related measurement and simulation data in a vendor-independent manner. Appropriate definitions and event categories to be developed by other task forces under the IEEE Standards Coordinating Committee 22 (SCC-22) on Power Quality and the IEEE 1159 Working Group on Power Quality Monitoring

- [Current PAR Record](#)
- [Related Documents](#)
- [Next Meeting](#): the task force normally meets with the working groups and task forces of the IEEE Power Quality Subcommittee

IEEE | [IEEE Power & Energy Society](#)
[IEEE Transmission and Distribution Committee](#) | [IEEE Power Quality Subcommittee](#)

Done Internet 100%

Web Site Updated



IEEE P1159.3 On-Line Documents - Windows Internet Explorer

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IEEE P1159.3 On-Line Documents

The following documents relate to the work of the IEEE P1159.3 Task Force.

Meeting Notes

- [July 2009](#), Calgary, Alberta, Canada

Drafts of IEEE P1159.3



The drafts of IEEE P1159.3, Recommended Practice for the Transfer of Power Quality Data, can be accessed from this web site only if you have a user name and password. Contact the task force [chair](#) or [secretary](#) to obtain the latest password.

- [IEEE 1159.3 PQDIF Draft 9](#) (Recirculated Ballot Document)
- [IEEE 1159.3 PQDIF Draft 8](#) (First Ballot Document)
- [IEEE 1159.3 PQDIF Draft 7](#)
- [IEEE 1159.3 PQDIF Draft 6](#)
- [IEEE 1159.3 PQDIF Draft 5](#)
- [IEEE 1159.3 PQDIF Draft 4](#)
- [IEEE 1159.3 PQDIF Draft 3](#)
- [IEEE 1159.3 PQDIF Draft 2](#)

Source Code Header Files

These files are the core of the specification. They contain all of the tags listed in the normative annexes in the standard. These files are updated periodically as vendors find bugs and add new tags. The updates are always backward compatible. These files replace like named files in the SDK.

- [PQDIF Physical Format Definitions - C Header File](#)
- [PQDIF Logical Format Definitions - C Header File](#)



Internet 100%

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 Forms for Submitting New Tags and IDs

The screenshot shows a web browser window titled "PQView - Submit New PQDIF ID - Windows Internet Explorer". The address bar shows the URL "http://www.pqview.com/pqdif-submit-id/". The browser's menu bar includes "File", "Edit", "View", "Favorites", "Tools", and "Help". The address bar contains "PQView - Submit New PQDIF ID".

The main content area features the IEEE PES logo (Power & Energy Society™) and a navigation bar with links for "Login", "Register", "Search", "E-Mail", and "Links". The user is logged in as "Electrotek - Dan Sabin" with a "Logout" link.

The main heading is "Submit New PQDIF ID". Below it, the text reads: "Use this form to submit a new ID value for the next revision of IEEE Std. 1159.3. Upon submission, the new ID will be reviewed by a future meeting of the IEEE Std. 1159.3 Task Force."

A sidebar menu on the left lists the following items: "IEEE PQDIF", "IEEE 1159.3", "PQDIF Tags", "PQDIF ID", "New Tag", "New ID", "Discussion", "PQDiffactor", and "Download". The "PQDIF ID" link is circled in red.

A "PQDIF Tag" section contains the instruction: "Specify the tag to be associated with the new ID, either by selecting a tag from the drop-down list box or by entering the name of a new tag in the text box."

New Web Forms for Submitting New Tags and IDs

The screenshot shows a web browser window titled "PQView - Submit New PQDIF ID - Windows Internet Explorer". The address bar shows the URL "http://www.pqview.com/pqdif-submit-id/". The browser's menu bar includes "File", "Edit", "View", "Favorites", "Tools", and "Help". A "Favorites" bar is visible below the menu bar. The main content area is titled "PQView - Submit New PQDIF ID" and features a navigation menu on the left with links for "New Tag", "New ID", "Discussion", "PQDiffactor", and "Download". The main form area is titled "PQDIF Tag" and contains the following sections:

- PQDIF Tag**: A section with the instruction "Specify the tag to be associated with the new ID, either by selecting a tag from the drop-down list box or by entering the name of a new tag in the text box." It includes a "Select PQDIF Tag" dropdown menu and a text box for "Specify Unlisted PQDIF Tag" containing the text "tag".
- ID Properties**: A section with the instruction "Specify the name, description, and value for the new ID." It includes an "ID Name *" text box containing "ID_" and an "ID Description" text box.

The browser's status bar at the bottom shows "Internet" and "100%". A user profile "Electrotek - Dan Sabin" and a "Logout" link are visible in the top right corner of the application interface.

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.

tagVendorID: Standard IDs in IEEE 1159.3-2003

- ID_VENDOR_NONE
- ID_VENDOR_ACTL
- ID_VENDOR_ADVANTECH
- ID_VENDOR_BMI
- ID_VENDOR_BPA
- ID_VENDOR_CESI
- ID_VENDOR_COOPER
- ID_VENDOR_DCG
- ID_VENDOR_DRANETZ
- ID_VENDOR_EDF
- ID_VENDOR_ELCOM
- ID_VENDOR_ELECTROTEK
- ID_VENDOR_EPRI
- ID_VENDOR_FLUKE
- ID_VENDOR_GE
- ID_VENDOR_HYDROQUEBEC
- ID_VENDOR_IEEE
- ID_VENDOR_KREISSJOHNSON
- ID_VENDOR_LEM
- ID_VENDOR_METONE
- ID_VENDOR_METROSONIC
- ID_VENDOR_PMI
- ID_VENDOR_PML
- ID_VENDOR_PSI
- ID_VENDOR_PTI
- ID_VENDOR_PUBLICDOMAIN
- ID_VENDOR_RPM
- ID_VENDOR_SATEC
- ID_VENDOR_SQUAREDPOWERLOGIC
- ID_VENDOR_TELOG
- ID_VENDOR_TRINERGI
- ID_VENDOR_WPT

tagVendorID: ID Values Recently Proposed using Web Site Form

- ID_VENDOR_A_EBERLE
- ID_VENDOR_ALPESTECHNOLOGIES
- ID_VENDOR_AMETEK
- ID_VENDOR_ARBITER
- ID_VENDOR_ELECTRO_INDUSTRIES
- ID_VENDOR_ELSPEC
- ID_VENDOR_EMAX
- ID_VENDOR_HIOKI
- ID_VENDOR_LANDIS_GYR
- ID_VENDOR_METRUM
- ID_VENDOR_NEXANT
- ID_VENDOR_ORL
- ID_VENDOR_PSL
- ID_VENDOR_SST
- ID_VENDOR_UNIPOWER

tagEquipID : ID Values Recently Proposed using Web Site Form

- ID_EQUIP_ARBITER_1133A
- ID_EQUIP_ELSPEC_PQSCADA
- ID_EQUIP_EMAX_DIRECTOR
- ID_EQUIP_ETK_PQDIFFRACTOR
- ID_EQUIP_LANDIS_GYR_MAXCOM
- ID_EQUIP_PQUBE
- ID_EQUIP_SST_IGRID
- ID_EQUIP_WPT_61000
- ID_EQUIP_WPT_ES210
- ID_EQUIP_WPT_ES230
- ID_EQUIP_ORL_AP300
- ID_EQUIP_ORL_OTHER
- ID_EQUIP_ORL_PM1000
- ID_EQUIP_ORL_PM1200
- ID_EQUIP_ORL_PM2000
- ID_EQUIP_ORL_PM2200
- ID_EQUIP_ORL_PM3000
- ID_EQUIP_ORL_PM3006
- ID_EQUIP_ORL_PM4000
- ID_EQUIP_ORL_PM6000
- ID_EQUIP_ORL_PM7000
- ID_EQUIP_ORL_RANGER_II
- ID_EQUIP_ORL_RANGER_III
- ID_EQUIP_ORL_RANGER_IV
- ID_EQUIP_ORL_RANGERHA5000
- ID_EQUIP_ORL_RANGERMETERSOCKET
- ID_EQUIP_ORL_RANGERRR1250
- ID_EQUIP_ORL_RANGERSCOUT

tagPhaseID: Standard IDs in IEEE 1159.3-2003

- ID_PHASE_NONE
- ID_PHASE_AB
- ID_PHASE_AN
- ID_PHASE_BC
- ID_PHASE_BN
- ID_PHASE_CA
- ID_PHASE_CN
- ID_PHASE_NG
- ID_PHASE_RES
- ID_PHASE_NET
- ID_PHASE_TOTAL
- ID_PHASE_LN_AVE
- ID_PHASE_LL_AVE
- ID_PHASE_MINUS
- ID_PHASE_PLUS
- ID_PHASE_WORST
- ID_PHASE_GENERAL_1
- ID_PHASE_GENERAL_2
- ID_PHASE_GENERAL_3
- ID_PHASE_GENERAL_4
- ID_PHASE_GENERAL_5
- ID_PHASE_GENERAL_6
- ID_PHASE_GENERAL_7
- ID_PHASE_GENERAL_8
- ID_PHASE_GENERAL_9
- ID_PHASE_GENERAL_10
- ID_PHASE_GENERAL_11
- ID_PHASE_GENERAL_12
- ID_PHASE_GENERAL_13
- ID_PHASE_GENERAL_14
- ID_PHASE_GENERAL_15
- ID_PHASE_GENERAL_16

tagPhaseID: ID Values Recently Proposed using Web Site Form

ID_PHASE_A	Phase A only	For current only?
ID_PHASE_AC	Phase A with respect to C	Explanation Needed
ID_PHASE_AG	A-to-Ground	OK
ID_PHASE_B	Phase B only	For current only?
ID_PHASE_BA	Phase B with respect to A	Explanation Needed
ID_PHASE_BG	B-to-Ground	OK
ID_PHASE_C	Phase C only	For current only?
ID_PHASE_CB	Phase C with respect to B	Explanation Needed
ID_PHASE_CG	C-to-Ground	OK
ID_PHASE_L	Line	Explanation Needed
ID_PHASE_L1	Line1	OK?
ID_PHASE_L1N	Line1-to-Local Neutral	OK?
ID_PHASE_L2	Line2	OK?
ID_PHASE_L2N	Line2-to-Local Neutral	OK?
ID_PHASE_LL	Line1-to-Line2	OK?
ID_PHASE_LN	Line-to-Neutral	OK?
ID_PHASE_N	Neutral	OK?
ID_PHASE_LN_MAX	The value representing maximum of 3 line-neutral values	OK
ID_PHASE_LL_MAX	The value representing maximum of 3 line-line values	OK
ID_PHASE_LN_MIN	The value representing minimum of 3 line-neutral values	OK
ID_PHASE_LL_MIN	The value representing minimum of 3 line-line values	OK

Recently Proposed New Tags

tagTimeEnd

- Tag to store the end time of an observation
- Used in conjunction with the **tagTimeStart** value, the summary period is defined as range greater than or equal to the start time and less than the end time
- Explanation Needed

Recently Proposed New Tags

tagCharactDistDirection

- The estimated or known direction of the disturbance that causes a disturbance.
- Possible IDs
 - ID_DISTDIR_UNKNOWN = 0
 - ID_DISTDIR_UPLINE = 1
 - ID_DISTDIR_DOWNLINE = 2
- OK

Recently Proposed New Tags

tagDebug

- Arbitrary comments to assist debugging. This tag can be applied at any PQDIF element.
- Best kept proprietary?

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

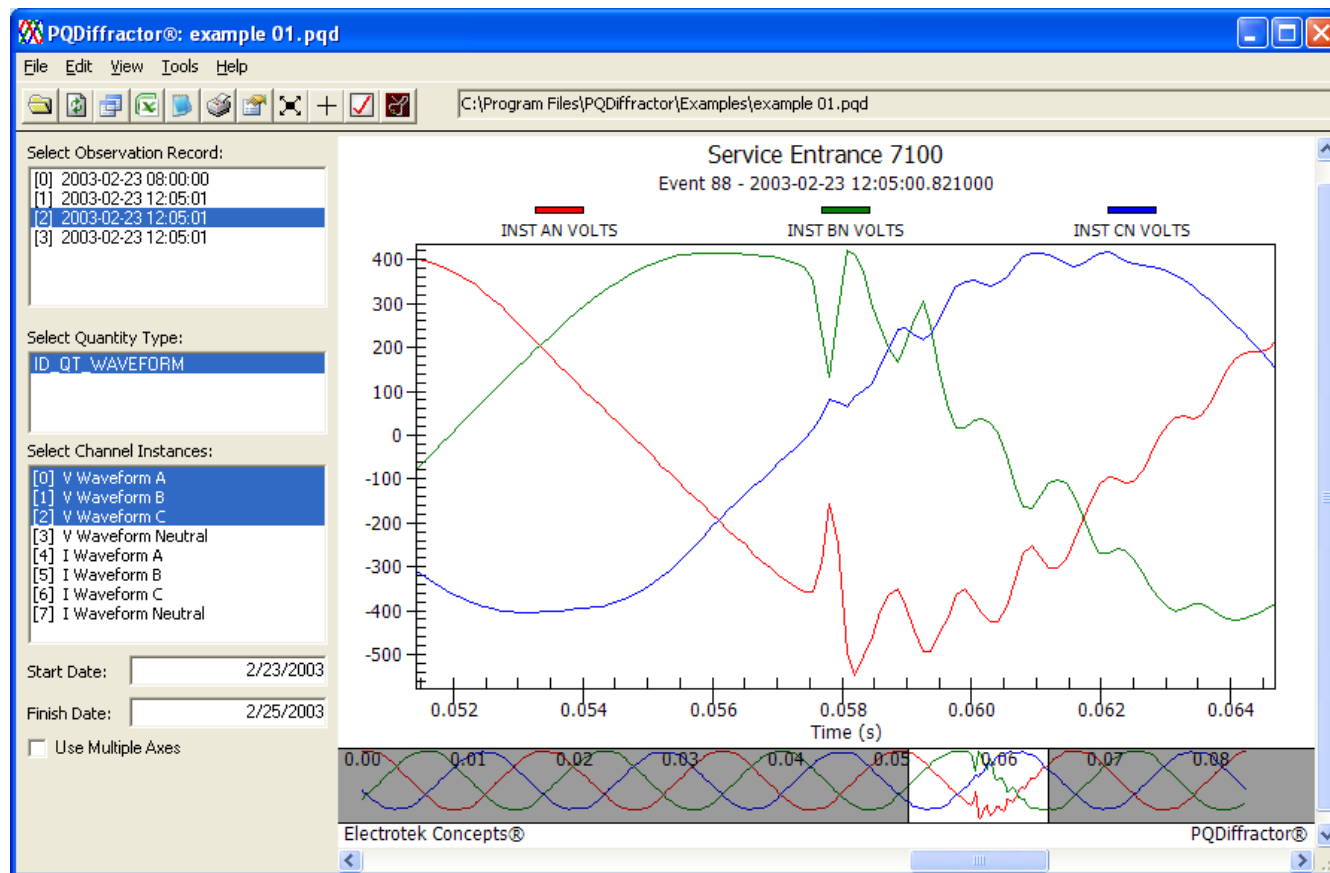
```
<tagStorageMethodID VT="UINT4">ID_SERIES_METHOD_VALUES</tagStorageMethodID>
</tagSeriesDefns>
</tagOneChannelDefn>
- <tagOneChannelDefn>
  <tagChannelName VT="CHAR1" ET="T">V THD BC</tagChannelName>
  <tagPhaseID VT="UINT4">ID_PHASE_BC</tagPhaseID>
  <tagQuantityTypeID VT="GUID">ID_QT_VALUELOG</tagQuantityTypeID>
  <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>
```

New PQDIF Resources on Internet

- <http://grouper.ieee.org/groups/1159/3/private/>
- 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

PQDiffractor

- PQDiffractor 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 Conversion Functions

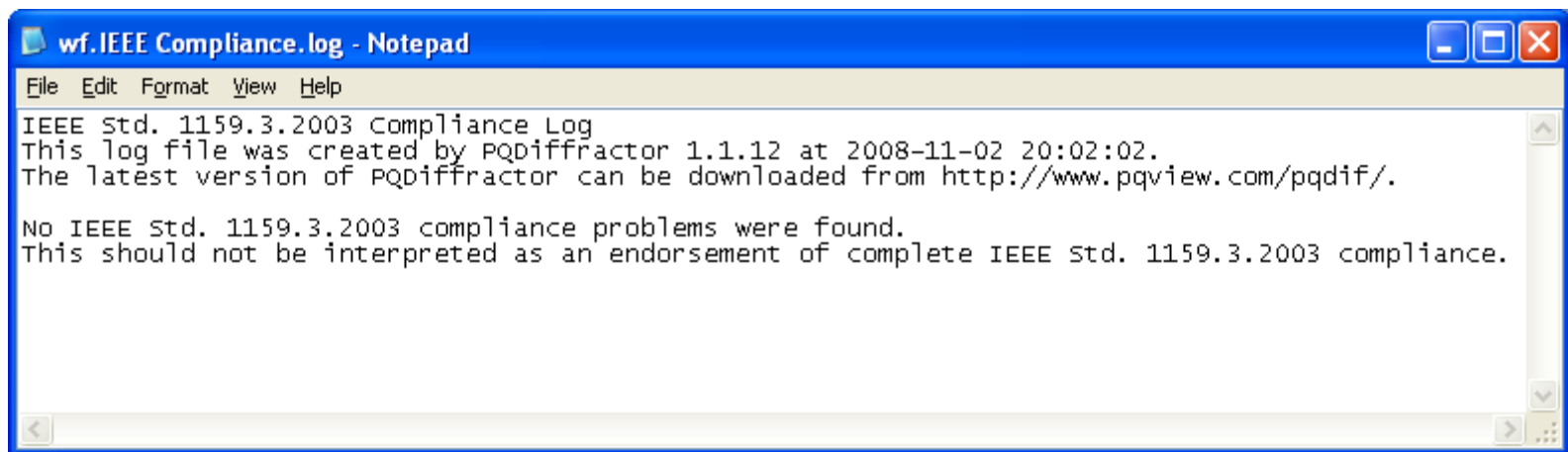
- Convert from native binary PQD to XML
- Convert from native binary PQD to XML Structure

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:
 - <http://grouper.ieee.org/groups/1159/3/private/>
- PQDiffraction is freely redistributable and has been downloaded by about 200 different individuals since November 2008.

PAR?

- Are we ready to apply for a PAR to revise IEEE 1159.3?