

IEEE P1159.3 PQDIF Task Force Web Meeting

Daniel Sabin
Electrotek Concepts, Inc.

d.sabin@ieee.org



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New Orleans, Louisiana, USA

Meeting Agenda

- Patent Notice
- Task Force Overview
- Recent Task Force Activities
- Last Meetings
- Proposals for New PQDIF IDs
- Next Steps
- Next Meeting

Participants, Patents, and Duty to Inform

- All participants in this meeting have certain obligations under the IEEE-SA Patent Policy.
 - Participants [Note: Quoted text excerpted from IEEE-SA Standards Board Bylaws subclause 6.2]:
 - “Shall inform the IEEE (or cause the IEEE to be informed)” of the identity of each “holder of any potential Essential Patent Claims of which they are personally aware” if the claims are owned or controlled by the participant or the entity the participant is from, employed by, or otherwise represents
 - “Personal awareness” means that the participant “is personally aware that the holder may have a potential Essential Patent Claim,” even if the participant is not personally aware of the specific patents or patent claims
 - “Should inform the IEEE (or cause the IEEE to be informed)” of the identity of “any other holders of such potential Essential Patent Claims” (that is, third parties that are not affiliated with the participant, with the participant’s employer, or with anyone else that the participant is from or otherwise represents)
 - The above does not apply if the patent claim is already the subject of an Accepted Letter of Assurance that applies to the proposed standard(s) under consideration by this group
 - Early identification of holders of potential Essential Patent Claims is strongly encouraged
 - No duty to perform a patent search



Call for Potentially Essential Patents

- If anyone in this meeting is personally aware of the holder of any patent claims that are potentially essential to implementation of the proposed standard(s) under consideration by this group and that are not already the subject of an Accepted Letter of Assurance (LOA):
 - Either speak up now, or
 - Provide the chair of this group with the identity of the holder(s) of any and all such claims as soon as possible, or
 - Cause an LOA to be submitted



Patent Related Links

- All participants should be familiar with their obligations under the IEEE-SA Policies & Procedures for standards development.
- Patent Policy is stated in these sources:
 - IEEE-SA Standards Boards Bylaw
 - <http://standards.ieee.org/develop/policies/bylaws/sect6-7.html#6>
 - IEEE-SA Standards Board Operations Manual
 - <http://standards.ieee.org/develop/policies/opman/sect6.html#6.3>
 - Material about the patent policy is available at
 - <http://standards.ieee.org/about/sasb/patcom/materials.html>

If you have questions, contact the IEEE-SA Standards Board Patent Committee Administrator at patcom@ieee.org or visit <http://standards.ieee.org/about/sasb/patcom/index.html>

This slide set is available at <https://development.standards.ieee.org/myproject/Public/mytools/mob/slideset>.



Other Guidelines for IEEE WG Meetings

- All IEEE-SA standards meetings shall be conducted in compliance with all applicable laws, including antitrust and competition laws.
 - Do not discuss the interpretation, validity, or essentiality of patents/patent claims.
 - Do not discuss specific license rates, terms, or conditions.
 - Relative costs, including licensing costs of essential patent claims, of different technical approaches may be discussed in standards development meetings.
 - Technical considerations remain primary focus
 - Do not discuss or engage in the fixing of product prices, allocation of customers, or division of sales markets.
 - Do not discuss the status or substance of ongoing or threatened litigation.
 - Do not be silent if inappropriate topics are discussed ... do formally object.
- See IEEE-SA Standards Board Operations Manual, clause 5.3.10 and “Promoting Competition and Innovation: What You Need to Know about the IEEE Standards Association’s Antitrust and Competition Policy” for more details.



IEEE P1159.3 Task Force Overview

IEEE Power & Energy Society (PES)

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

Task Force Web Site

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

Chair: Daniel Sabin (d.sabin@ieee.org)

Secretary: Richard Bingham (r.bingham@ieee.org)



What is IEEE PQDIF?

- PQDIF is defined in IEEE Std 1159.3-2003
 - a “recommend practice” for power quality data interchange format that allows exchange of measurements and simulation results between computer hardware and software systems
- PQDIF is a binary format that features optional lossless compression
 - Freeware *zlib* algorithm is specified for compression.

How are PQDIF Files Provided by Vendors?

- A single PQDIF file
- A folder of one or more PQDIF files
- From a folder following Annex C of IEEE 1159.3
 - PQDIFPOF (PQDIF “Pile of Files”)
 - A text file named pqdifpof.ini identifying subfolders with the PQDIF files for each meter named using an ISO 8601 file naming convention

Example IEEE 1159.3 Annex C Folder

The screenshot displays two overlapping Windows Explorer windows. The top window shows the main folder structure, and the bottom window shows the contents of 'Folder 01'.

Top Window: IEEE 1159.3 Annex C Folder

Name	Date modified	Type	Size
Folder 01	4/19/2013 11:20 AM	File folder	
Folder 02	4/19/2013 11:20 AM	File folder	
Folder 03	4/19/2013 11:20 AM	File folder	
pqdfpof.ini	3/16/2012 4:32 PM	Configuration sett...	1 KB

Bottom Window: Example IEEE 1159.3 Annex C Folder > Folder 01

Name	Date modified	Type	Size
20091017T030100.pqq	10/15/2009 11:46 ...	Power Quality Data	234 KB
20091017T060200.pqq	10/16/2009 3:31 AM	Power Quality Data	292 KB
20091018T000000.pqq	10/16/2009 10:40 ...	Power Quality Data	228 KB
20091018T060200.pqq	10/17/2009 3:30 AM	Power Quality Data	294 KB
20091020T040000.pqq	10/19/2009 5:49 PM	Power Quality Data	606 KB
20091021T060200.pqq	10/20/2009 3:30 AM	Power Quality Data	293 KB
20091021T184525.pqq	10/20/2009 3:30 PM	Power Quality Data	174 KB
20091022T060200.pqq	10/21/2009 3:30 AM	Power Quality Data	294 KB
20091023T000000.pqq	10/21/2009 9:35 PM	Power Quality Data	220 KB
20091023T064526.pqq	10/22/2009 3:30 AM	Power Quality Data	293 KB
20091025T040000.pqq	10/26/2009 1:01 PM	Power Quality Data	854 KB
20091027T150500.pqq	10/26/2009 1:01 PM	Power Quality Data	362 KB
20091028T060200.pqq	10/27/2009 3:31 AM	Power Quality Data	293 KB

20091018T000000.pqq Date modified: 10/16/2009 10:40 PM Date created: 12/10/2013 8:26 AM
Power Quality Data Size: 227 KB

PQDIF and Regulatory Bodies

- China Southern Power Grid
 - Operates and oversees transmission and distribution grids in Guangdong, Guangxi, Yunnan, Guizhou, and Hainan Provinces
 - In January 2012, CSG began to integrate power quality monitoring data from the individual PQMS databases maintained by each province into a central database in Guangzhou.
 - Each province is required to provide data to CSG in PQDIF files monthly for a total of about 2000 power quality monitors.

PQDIF and Regulatory Bodies

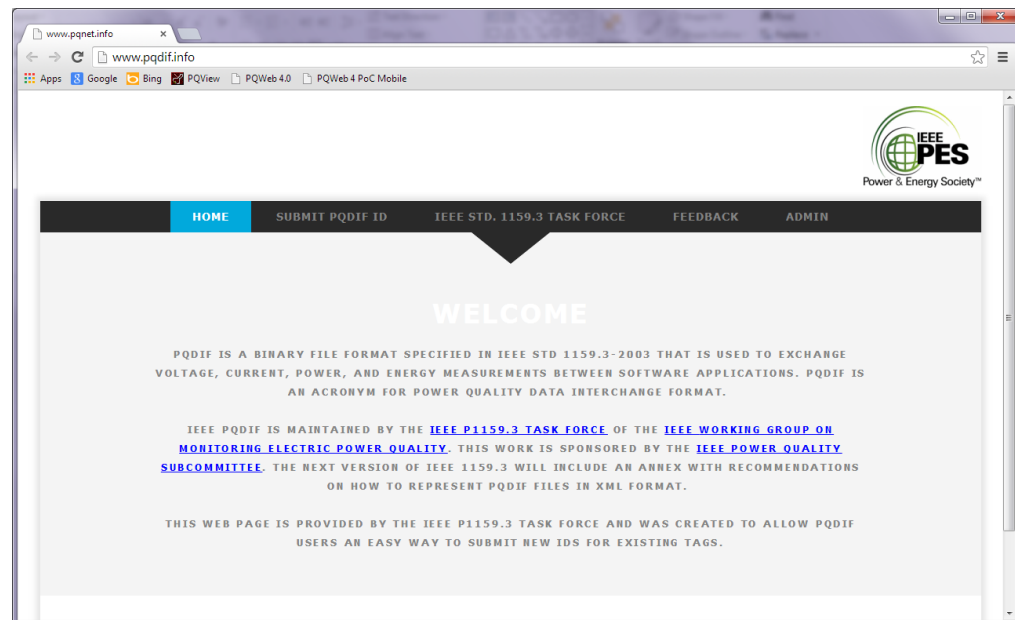
- Norwegian Water Resources and Energy Directorate (NVE)
 - Regulates electricity in Norway
 - Requires all grid companies must continuously record power quality statistics at a sampling of sites that represent their transmission or distribution system
 - Beginning on February 1, 2015, all grid companies must provide NVE with an IEEE Std 1159.3 PQDIF file for the prior year for sags, swells, THD, Pst, and Plt.

P1159.3 Software Libraries

- Downloadable from IEEE P1159.3 Task Force Web Site at <http://grouper.ieee.org/groups/1159/3/docs.html>
- PQDiffactor: Free application for viewing and debugging PQDIF files in charts and tables.
- IEEE PQDIF Libraries
 - Source Code for C++ Libraries for Reading and Writing PQDIF Files
- PQDCOM4.DLL
 - Source Code for Microsoft Windows ActiveX/COM Library for reading and writing PQDIF files
 - Intended for Use with Visual Basic, Microsoft Office VBA, MATLAB, etc.
- PQDIF.NET
 - Source Code for Microsoft Windows .NET Component Library for reading and writing PQDIF files that has similar interfaces to PQDCOM4.DLL
 - Intended for Use with .NET Applications Built using C# or VB.NET

New Web Site Created in July 2012 to Assist in Collecting Information for New PQDIF IDs

- The task force has created a new web site that will allow users an easy way to submit new IDs for existing tags
- Web Site Rebuilt Completely in August/September 2013 and now linked from the main task force web site
- www.pqdif.info






Last Meetings

- July 2013 Web Meeting
 - Attended by fifteen people, most of whom do not regularly attend IEEE PES meetings
 - Presented an overview of IEEE Std 1159.3-2003, on-line methods for submitting feedback and new PQDIF IDs, and requested participation of correspondence members
 - New task force members recruited during web meeting, including Stéphane Do, Praveen Buchupalli, Fernando Pimenta, Michael Schwenke, and Jeffrey

Last Meetings

- July 2013 IEEE PES General Meeting
 - Reviewed new submissions
 - Approved ID_SERIES_VALUE_TYPE_RMS as a new tagValueTypeID
 - This was to complement ID_SERIES_VALUE_TYPE_AVG

Planned Task Force Activities during 2013-2016

- Build New PQDIF Library for .NET 
- Build New Web Site for PQDIF ID Submissions 
- Submit Project Authorization Request to Revise IEEE Std 1159.3
- Complete editorial changes and corrections to 2003 edition of IEEE Std. 1159.3 
- Add new ID values for existing tags (ongoing)
- Add new tags and ID values (ongoing)
- Add new quantity types
- Add annex on representation of PQDIF in XML
- Add annex on PQDIF and its relationship to IEC 61850
- Add annex on PQDIF and its relationship to IEEE/IEC COMTRADE
- Post New Versions of IEEE C++, COM, and .NET Libraries
- Vote on new version of IEEE Std 1159.3 in early 2016

New PAR: Proposed Project Title

- Recommended Practice for Power Quality Data Interchange Format (PQDIF)
- Note that IEEE Std 1159.3 has the title, “IEEE Recommended Practice for the Transfer of Power Quality Data”

New PAR: Proposed Project Scope

- This recommended practice specifies the PQDIF file format for the transfer of power quality data between instruments and computers. This includes raw, processed, simulated, proposed, specified, and calculated data.
- The transfer file format includes the data as well as appropriate characterization parameters, such as sampling rate, resolution, calibration status, instrument identification, and other pertinent or desired characteristics or data.
- The recommended practice provides criteria guidelines for transferring power quality data.

New PAR: Proposed Project Purpose

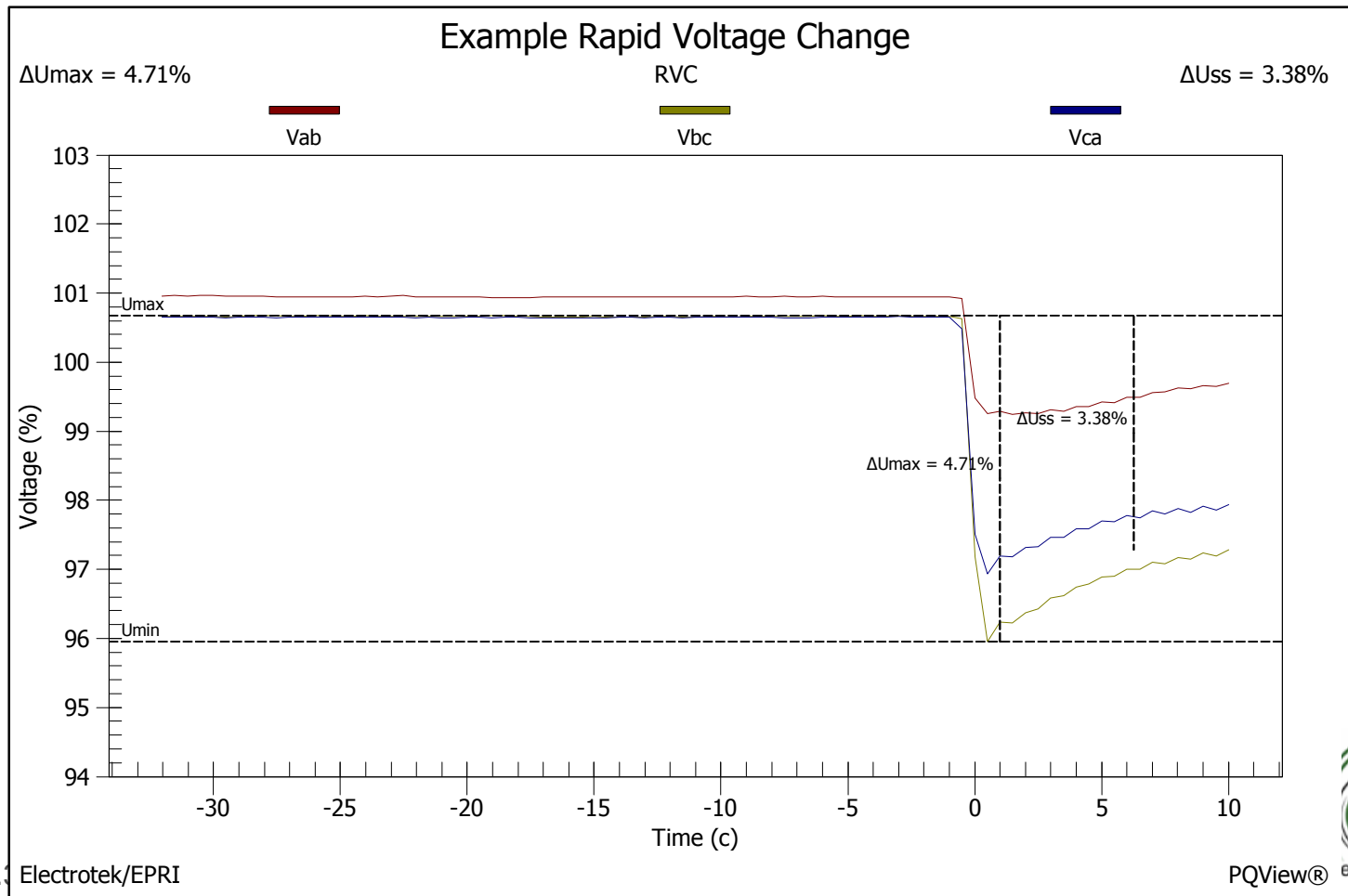
- IEEE 1159.3 provides the power quality industry with specification for the PQDIF file format, which an adequate open and accepted data format standard for the transfer of power quality data between instruments and computers. This transfer standard significantly allows the analysis process of power quality assessments using multi-vendor and multi-device data.
- Wider acceptance of this industry standard for power quality data transfer format will significantly add to the value of all power quality data and open new opportunities for the resolution, planning and understanding of power quality activities. This will serve to satisfy the validation, trending, overlay, spectrum analysis, and other needs of client activities.

New Draft Posted to Web Site

- IEEE 1159.3 PQDIF Draft 11, January 13, 2014
 - <http://grouper.ieee.org/groups/1159/3/docs.html>
 - Reflow of Draft 9 into the current Microsoft Word version of the IEEE Standards document template.
 - Minor editorial fixes and/or changes in addition to the overall reflow itself
 - Incorporation of new IDs approved over the past few P1159.3 Task Force meetings

Revision Requested by Norwegian Regulator (NVE) in November 2012 and December 2013

- Provide quantity types of quantity characteristic ID values that could be used to store rapid voltage change (RVC) values for individual events and for RVC event lists



July 2012 Draft of IEC 61000-4-30, Edition 3

RVC Event Characterization

- The start time of an RVC event shall be time stamped with the time that the 'voltage-is-steady-state' logic signal became false and initiated the RVC event.
- The RVC event duration is 1 second shorter than duration of the false state of the 'voltage-is-steady-state' logic signal. If the RVC duration exceeds one minute, the RVC event may be reported with an undefined duration.
- The RVC event ΔU_{max} is the maximum absolute difference between the $U_{rms}(1/2)$ values during the RVC event, and the final $U_{rms}(1/2)$ value during the preceding steady-state condition.
- The RVC event ΔU_{ss} is the absolute difference between the final $U_{rms}(1/2)$ value during the preceding steady-state condition and the $U_{rms}(1/2)$ value when the steady-state logic signal goes true at the end of the RVC event.

RVC Event List Recommendations

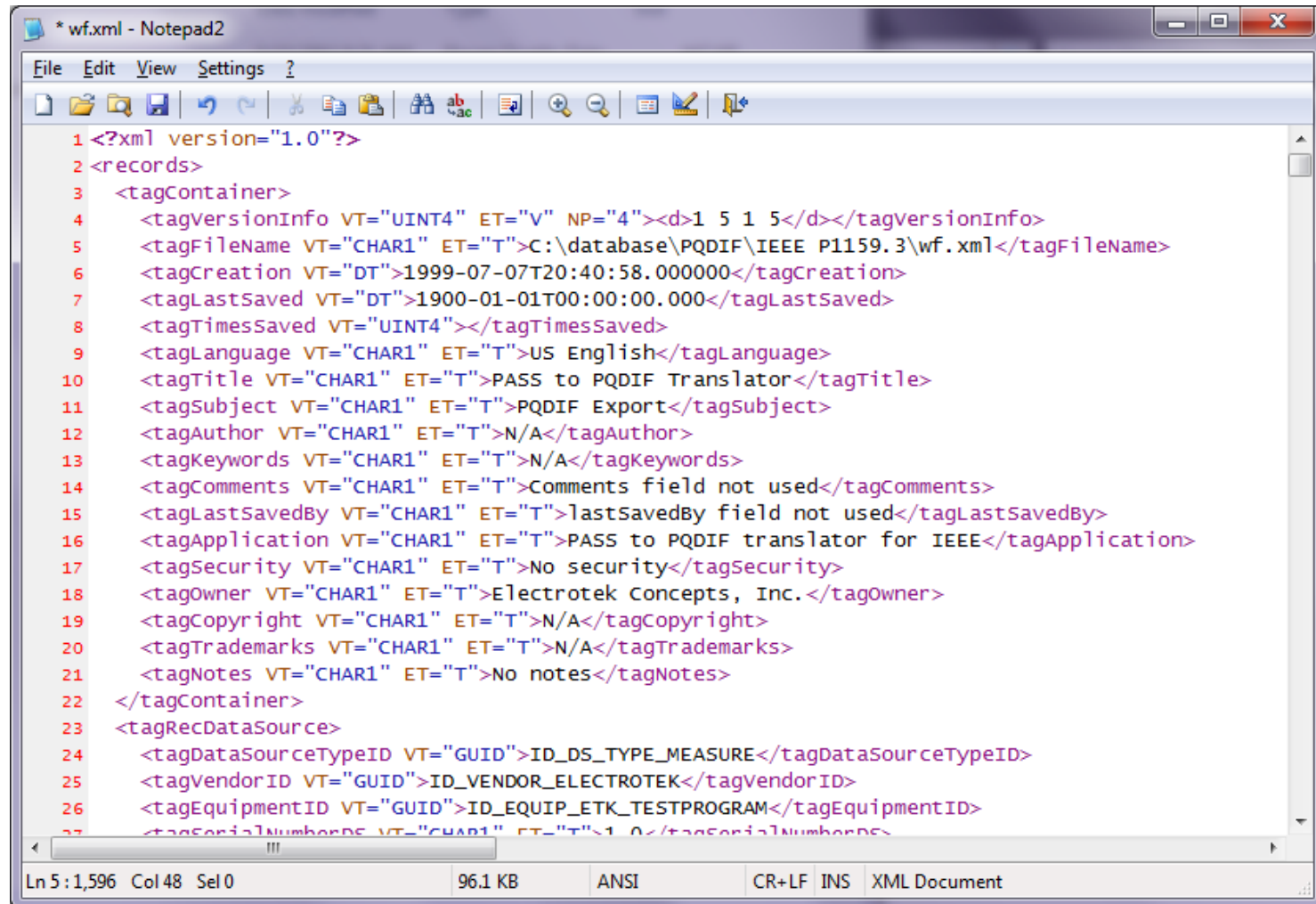
Use ID_QT_MAGDURTIME

- This quantity type was envisioned to primary store rms variation events lists, but already it has been used by some vendors to store transient event lists. This overloading should be encouraged in the revision, but the text in 1159.3 needs to be edited to provide examples of how to store event lists.
 - rms variation event list
 - transient event list
 - rapid voltage change event list
 - For ΔU_{max} , use the existing ID ID_QC_RAPID_VOLTAGE_CHANGE but change its name to ID_QC_RVC_DELTA UMAX
 - For ΔU_{ss} , specify a new ID named ID_QC_RVC_DELTA USS

Proposed New EN 50160 Disturbance Categories

- Requested by Fernando Pimenta and Praveen Buchupalli
 - ID_EN50160_DIP
 - ID_EN50160_SWELL
 - ID_EN50160_INTERRUPT
- Currently, tagDisturbanceCategoryID allows for just one IEEE 1159 category (e.g., ID_DISTURB_1159_SHORTDUR, ID_DISTURB_1159_SHORTDUR_INSTANT_SAG, etc.)
- January 2014: Create a new disturbance category (e.g., tagDisturbanceCategoriesID) that can be an array of values, and add the new IDs

Proposed Annex on Representation of PQDIF in XML



```
* wf.xml - Notepad2
File Edit View Settings ?
1 <?xml version="1.0"?>
2 <records>
3   <tagContainer>
4     <tagVersionInfo VT="UINT4" ET="V" NP="4"><d>1 5 1 5</d></tagVersionInfo>
5     <tagFileName VT="CHAR1" ET="T">C:\database\PQDIF\IEEE P1159.3\wf.xml</tagFileName>
6     <tagCreation VT="DT">1999-07-07T20:40:58.000000</tagCreation>
7     <tagLastSaved VT="DT">1900-01-01T00:00:00.000</tagLastSaved>
8     <tagTimesSaved VT="UINT4"></tagTimesSaved>
9     <tagLanguage VT="CHAR1" ET="T">us English</tagLanguage>
10    <tagTitle VT="CHAR1" ET="T">PASS to PQDIF Translator</tagTitle>
11    <tagSubject VT="CHAR1" ET="T">PQDIF Export</tagSubject>
12    <tagAuthor VT="CHAR1" ET="T">N/A</tagAuthor>
13    <tagKeywords VT="CHAR1" ET="T">N/A</tagKeywords>
14    <tagComments VT="CHAR1" ET="T">Comments field not used</tagComments>
15    <tagLastSavedBy VT="CHAR1" ET="T">lastSavedBy field not used</tagLastSavedBy>
16    <tagApplication VT="CHAR1" ET="T">PASS to PQDIF translator for IEEE</tagApplication>
17    <tagSecurity VT="CHAR1" ET="T">No security</tagSecurity>
18    <tagOwner VT="CHAR1" ET="T">Electrotek Concepts, Inc.</tagOwner>
19    <tagCopyright VT="CHAR1" ET="T">N/A</tagCopyright>
20    <tagTrademarks VT="CHAR1" ET="T">N/A</tagTrademarks>
21    <tagNotes VT="CHAR1" ET="T">No notes</tagNotes>
22  </tagContainer>
23  <tagRecDataSource>
24    <tagDataSourceTypeID VT="GUID">ID_DS_TYPE_MEASURE</tagDataSourceTypeID>
25    <tagVendorID VT="GUID">ID_VENDOR_ELECTROTEK</tagVendorID>
26    <tagEquipmentID VT="GUID">ID_EQUIP_ETK_TESTPROGRAM</tagEquipmentID>
27    <tagSerialNumbers VT="CHAR1" ET="T">1 0</tagSerialNumbers>

```

Ln 5:1,596 Col 48 Sel 0 96.1 KB ANSI CR+LF INS XML Document

Proposed Annex on PQDIF's Relationship to IEC 61850

- IEC 61850-8-1 defines file classes that can be mapped to the Manufacturing Message Specification (MMS) file object.
 - PQDIF Files and COMTRADE Files,
 - Other supported file types: bin, dtd, gif, htm, txt, xml, xsd, zip
- IEC Technical Report (TR IEC 61850-90-17) is to be completed in about one year. It will specify how to use IEC 61850 to transmit power quality data.
- It is a collaboration of IEC TC57 and TC85.
- We can participate in writing this document and incorporate a summary in our proposed annex.

Proposed Annex of PQDIF's Relationship to IEEE/IEC COMTRADE

- We plan to include an annex that compares PQDIF and COMTRADE
- Source material for the annex could draw on the IEEE Power Systems Relaying Committee Working Group H5C report on “Common Data Format for IED Sampled Data”
 - Summarized PQDIF, COMTRADE, and 61850
 - Explained issues related to converting data between the formats

Next P1159.3 Task Force Meetings

Next Web Meeting

- Mid March 2014?

2014 IEEE PES General Meeting

- Monday, July 28, 2014
- National Harbor, Maryland, USA