IEEE P1159.3 PQDIF Task Force Meeting

Chair: Daniel Sabin
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July 17, 2017
Chicago, Illinois, USA
Meeting Overview

• Overview of IEEE P1159.3 Revision Project
• Review of IEEE P1159.3 D15
• Approval of New PQDIF IDs
• Update on Software Resources
• 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
  - Material about the patent policy is available at

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

This slide set is available at

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.
Introductions
IEEE P1159.3 Task Force

IEEE Power & Energy Society
• Transmission & Distribution Committee
  – Power Quality Subcommittee
    http://grouper.ieee.org/groups/td/pq/
• P1159.3 PQDIF Task Force
  http://grouper.ieee.org/groups/1159/3
  – Chair: Daniel Sabin
d.sabin@ieee.org
  – Secretary: Joe Grappé
joseph.grappe@duke-energy.com
What is IEEE Std 1159.3 PQDIF?

- RMS Samples
- Phasors
- Mag-Dur Events
- Value Logs
- Scatter Charts
- Histograms

- Binary Format
- Extensible
- Lossless Compression
- Widely-Used Worldwide
Examples of Data Stored in IEEE 1159.3 PQDIF
Meeting Overview

- Overview of IEEE P1159.3 Revision Project
- Approval of New PQDIF IDs
- Review of IEEE P1159.3 D13
- Update on Software Resources
- Next Meeting
# Proposed Vendor and Equipment ID Values

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Approved / Disapproved / Needs Clarification</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID_VENDOR_MIKRONIKA</td>
<td>Mikronika</td>
<td>Approved</td>
</tr>
<tr>
<td>ID_VENDOR_BMR</td>
<td>BMR</td>
<td>Approved</td>
</tr>
<tr>
<td>ID_EQUIP_AMETEK_TR_3000</td>
<td>AMETEK TR-3000 Digital Fault Recorder</td>
<td>Approved</td>
</tr>
<tr>
<td>ID_EQUIP_SOCOMEC_DIRIS_Q800</td>
<td>SOCOMEC DIRIS Q800 Network Analyser</td>
<td>Approved</td>
</tr>
<tr>
<td>ID_EQUIP_BMR_PLA404</td>
<td>BMR PLA 404</td>
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<td>ID_EQUIP_BMR_PLA44</td>
<td>BMR PLA 44</td>
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<td>ID_EQUIP_BMR_PLA34</td>
<td>BMR PLA 34</td>
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<td>ID_EQUIP_BMR_PLA33</td>
<td>BMR PLA 33</td>
<td>Approved</td>
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<tr>
<td>ID_EQUIP_MIKRONIKA_SO52</td>
<td>Mikronika SO52</td>
<td>Approved</td>
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</table>
### Proposed Quantity Measured ID

<table>
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<tr>
<th>Name</th>
<th>Description</th>
<th>Approved / Disapproved / Needs Clarification</th>
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</thead>
<tbody>
<tr>
<td>ID_QM_FREQUENCY</td>
<td>Frequency</td>
<td>Disapproved</td>
</tr>
</tbody>
</table>
## Proposed Quantity Units ID

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Approved / Disapproved / Needs Clarification</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID_QU_NEWTONPERCOULOMBS</td>
<td>Electric field - Newtons/Coulombs</td>
<td>Disapproved</td>
</tr>
<tr>
<td>ID_QU_COULOMBS</td>
<td>Charge - Coulombs</td>
<td>Disapproved</td>
</tr>
</tbody>
</table>
# Proposed Quantity Characteristic ID

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
<th>Approved / Disapproved / Needs Clarification</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID_QC_SOLAR_IRRADIANCE</td>
<td>The power per unit area produced by the Sun in the form of electromagnetic radiation</td>
<td>Approved</td>
</tr>
</tbody>
</table>
### Proposed Clarification of Description of Harmonic Subgroups and Groups

<table>
<thead>
<tr>
<th>Name</th>
<th>Current Description</th>
<th>Proposed New Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ID_QC_SPECTRA_HGROUP</td>
<td>Spectra by Harmonic Group index</td>
<td>Spectra by Harmonic Subgroup Index (Accepted)</td>
</tr>
<tr>
<td>ID_QC_SPECTRA_IGROUP</td>
<td>Spectra by Interharmonic Group Index</td>
<td>Spectra by Interharmonic Subgroup Index (Accepted)</td>
</tr>
</tbody>
</table>

![Diagram showing harmonics and interharmonics](image)

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IEEE P1159.3 Task Force Web Meeting – July 17, 2017
Website for Submitting New IDs (www.pqdif.info)
Meeting Overview

• Overview of IEEE P1159.3 Revision Project
• Approval of New PQDIF IDs
• Review of IEEE P1159.3 D16
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• Next Meeting
P1159.3 Revision Title and Objectives Project

Title
Recommended Practice for Power Quality Data Interchange Format (PQDIF)

Objectives
1. To complete editorial changes and corrections to the 2003 edition of IEEE Std. 1159.3
2. To add new ID values for existing PQDIF tags
3. To add new tags and ID values
4. To add new quantity types
5. To add an annex on the representation of PQDIF in XML
6. To add an annex on PQDIF and its relationship to IEC 61850
7. To add an annex on PQDIF and its relationship to IEEE C37.111 COMTRADE

Deadline
December 2018
5.5.4 Use of IEEE Special Floating Point Numbers

- Special floating point numbers specified in IEEE Std 754 should not be stored in a PQDIF series instance. Specific examples of special number include positive infinity, negative infinity, not a number (NaN) values, quiet NaNs, and signaling NaNs.

- Missing data should be handled by ending a series instance and beginning a new series instance.
Flagging

5.5.5 Flagging

• IEC 61000-4-30 allows for a concept of flagging to be created.

• Propose that we create an observation record with one or more time stamps that correspond to the flagged ten-minute periods.
  – Set tagQuantityCharacteristicID to ID_QC_IEC_61000_4_30_FLAGGING
Annex E: Relationship of PQDIF to COMTRADE

• Draft Complete
Annex E: Relationship of PQDIF to IEC 61850

- Will summarize of IEEE PQDIF from IEC TR 61850-90-17 “Using IEC 61850 to Transmit Power Quality Data” with input from Dr. Michael Schwenke.
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Free or Freeware Software Resources Maintained by Task Force

• Software Developers Kit (SDK) from http://grouper.ieee.org/groups/1159/3/
  – Updated in October 2015
  – Includes IEEE PQDIF C++ Libraries
• PQDIF COM and .NET Libraries
  – Updated in June 2017 but not posted yet.
  – Will be updated after this meeting
• PQDiffractor® for Viewing/Diagnosing
  – Now providing IEEE Standard Conformity for COMTRADE files
  – Updated in April 2016
New Open Source Projects Related to PQDIF

xml_2_pqdif
• Converts XML files to binary PQDIF files
• [https://github.com/chenyu2202863/xml_2_pqdif](https://github.com/chenyu2202863/xml_2_pqdif)
• Last Update: April 2015

PQDIF Explorer
• Parses PQDIF files, displays records in tree control, views element contents
• [https://github.com/GridProtectionAlliance/PQDIFExplorer](https://github.com/GridProtectionAlliance/PQDIFExplorer)
• Last Update: January 2017
Next Steps

• Finalize input from this meeting.
• Circulate a final draft to the IEEE P1159.3 task force members by August 9, 2017
• Submit version for IEEE Technical Edit and submit pool in July/August 2017
• Vote on standard in October/November 2017
• Review comments in January 2018 (if necessary)
• Revise draft in February 2018 (if necessary)
• Recirculation Ballot in March 2018 (if necessary)

• Project Due Date: December 2018
Next P1159.3 Task Force Meeting

• 2018 IEEE PES Joint Technical Committee Meeting
• January 8, 2018
• Jacksonville, Florida, USA