# 2020 GM Meeting Minutes – Harmonics WG (519)

## Meeting Location and Time

Webex - Remote

2020 August 12  
2 PM – 3 PM EST

## MEEting Minutes

### Attendees

David Zech Julio Barros

Nick Zagrodnik Chester Li

Mark Halpin Eugene Song

Steven Johnston Marlin Browning

Kevin Kittredge Theo Laughner

Joe Grappe Francisc Zavoda

Bill Howe Jan Meyer

Marlin Browning Alkesh Patel

Harish Sharma Ali Arzani

Marty Page Randy Collins

Math Bollen Kang Lee

David Mueller Surya Santoso

Grazia Todeschini Nikunj Shah

Kenn Sedziol Mark Halpin

The meeting was called to order by David Zech at 2pm. Minutes were recorded by Nick Zagrodnik.

### Old Business

IEEE mandatory legal slides were reviewed by the Chair. No patents were identified by the attendees.

Par timeline was reviewed. Par expires 12/2021. Reviewed scope and purpose.

Discussed the decision to make 519 strictly a load-based standard. Kenn suggested using footnotes under tables 2-4 for reference to 1547 and P2800 when published.

Minutes from 2020 JTCM unanimously approved????

### New Business

Reviewed RPA decision making tree from IEEE1547 and discussed using the same concept to determine when 519, 1547 and 2800 apply in the presence of generation resources or lack there of.

Discussed need to insert interharmonic limit information in an informative annex of the new 519 draft. Need to reach out to Roberto Langella and Interhamonic TF

Discussed current limits >50th harmonic.

* Bill Howe voiced in favor of removing 50th harmonic order cap.
* Nikunj voiced concern about removing 50th harmonic order cap as it may lead to increased emissions above the 50th.
* Math Bollen voiced concern that we don’t have much knowledge or reasoning for establishing limits above the 50th and therefore is premature at this point.
* Kenn sited example from Larry Conrad where end-user intentionally targeted harmonics at the 63rd order as a loop hole to meeting harmonic limits (i.e. going beyond the 50th order)., which caused neighboring equipment issues. This happened to be due to a resonance issue.
* Grazia presented summary slides on UK Engineering G5/sub-group 5 recommendation for harmonic limits beyond the 50th order.
  + Focuses on harmonic voltage distortion
  + Limits extended up to 5kHz (100th order)
  + Power electronic equipment does emit harmonic frequencies beyond 50th order
  + THDv definition includes orders up to 100th
  + Evidence that distortion in LV networks above 50th order exists, but at low levels presently.
  + Formal presentation/report available for public download.
* Kenn suggested we may need to lead the initiative by making a change in the limits to motivate industry to better understand harmonic distortion in this frequency range.
* Some suggested adding another column to harmonic limits tables for orders between 50 to 100.
* Math Bollen brought up the point that HVDC do emit in this frequency range and of relatively significant magnitude. Manufacturers know the emissions of their equipment at those frequencies.

New THD Definitions discussed.

* Dave Mueller in favor of improving and expanding definitions for THD.
* Nick Zagrodnik shared working progress on this item to Dave Mueller who volunteered to review and potentially make some recommendations for the next draft.

Mark Halpin verbally provided IEC 61000-2-4 update on revisions to harmonic limits.

* IEC document recognizes that compatibility of equipment is higher compared to existing harmonic limits
* Dave Mueller asked question about validity of general understanding that significant motor heating will occur at voltage distortion levels above 10%. Mark Halpin responded by citing previous IEC work/research on private installations that can tolerate higher distortion levels.
* Harish referenced CIGRE report on consequential inefficiencies in utility power systems that result from elevated harmonic distortion and asked whether IEC has considered this.
* Math Bollen commented that THD

Mark Halpin provided update on 519.1

* Reviewed document sections and volunteers as established from Atlanta GM
* Highlighted areas still needing proposed writing for a draft
* Interharmonic Limits has not submitted anything as of yet. Follow-up with Roberto
* Eliminated increasing harmonic voltage limits on HV and EHV systems due to opposing working group vote to not increase limits.
* THD Definition section work needs more substance to make it to an accepted draft
* Changed Rationale for Limiting Considerations up to 3kHz to Rationale for Limiting Considerations up to 9kHz. Kenn volunteered to lead draft work on this section.
* Very Short Term Harmonic Considerations, update in progress. Need to contact Scott Peele
* Applications to Energy Producing Installations, lead became Dave Zech due to involvement with P2800
  + Explain decision making chart being proposed on when to use 519, 1547 or 2800
  + Harish, Nick and Dave Mueller to be technical reviewers to Dave Zech.
* Eliminated the need to review statistical evaluation section

Mark to have a draft of 519.1 sent to WG members prior to 12/2020. Kenn suggested setting deadline of late September 2020 for 519.1 document section volunteer work to be completed and submitted.

Meeting adjourned at 2:48 pm

### Summary of Volunteers for Future Activities:

New and carryover Action Items from 2019 JTCM

1. (New) Roberto Langella’s interharmonics team to write material for informative annex to be placed in P519.
2. (Carryover) Gary Nuzzi, Nick Zagrodnik and Mark Halpin to write justification and proposal for new THD definition that would include/take into account integer and interharmonics up to 50th.
3. (Carryover) Gary Nuzzi, Nick Zagrodnik and Mark Halpin to write justification and proposal for TDD that clearly states definition of what type of demand measurement interval to use.
4. (Carryover) Bill Howe volunteered Tom Cooke to write a piece on current state and improving measurement technology to enable PQ monitoring equipment to accurately measure distortion above the 50th. This section should also include difficulties/limitations of accurately measuring harmonic distortion on HV systems due to instrument transformers.