



PSCC Subcommittee P1 Meeting Minutes

Designation: P1	Name: Standard Profile for Use of IEEE 1588 Precision Time Protocol in Power System Applications. Amendment 1: Adding a TLV to indicate the latest IERS-specified UTC Leap Second Event.
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Meeting Location: Teams	Meeting Time: 10:00 CDT	Meeting Date: 2022/09/30	Minutes Revised: 2022/xx/yy	Minutes Approved: 2022/10/14
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PAR Submission Date: 2020-01-23	PAR Approval Date: 2020-03-05	PAR Expiration Date: 2024-12-31	Target Sponsor Ballot Date: N/A	Target Completion Date: N/A
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Presiding Officer: Chris Huntley, Chair	Recorded by: n/a	Draft Number: D2.4m_003e_220908b_2022-09-28
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Attendance:

			Attending via Phone (P) / Web (W) or Local (L)	M/CM/G
Name	Affiliation	Present?		
Members				
Christopher Huntley	SEL	X	W	M
Jay Anderson	SEL	X	W	M
Galina Antonova	Hitachi Energy	X	W	M
Ken Fodero	SEL	X	W	M
Jalal Gohari	WSP	X	W	M
Nicholas Kraemer	NuGrid Power Corp			M
Ya-Shian Li-Baboud	NIST	X	W	M
Sakis Meliopoulos	Georgia Tech.			M
Bruce Muschlitz	Novatech			M
Benton Vandiver	Hitachi Energy			M
Harsh Vardhan	GE	X	W	M
Jeff Dagle	PNNL	X	W	G
Erin Morales	IEEE	X	W	G

M: Member
 CM: Corresponding Member
 G: Guest

Item no.	Notes	Action by
CALL TO ORDER	Performed by Chair 10:05 CDT	C. Huntley
CALL FOR PATENTS	IEEE-SA slides presented to group. Response : negative.	C. Huntley
COPYRIGHT POLICY	IEEE-SA slides presented to group.	C. Huntley
BEHAVIOR SLIDES	Participant behavior in IEEE-SA activities slides presented to group.	C. Huntley
Attendees/Quorum	7 of 11 members attending; 9 total. Quorum achieved.	All
APPROVAL OF PREVIOUS MINUTES	Minutes of 2022-09-13 meeting was emailed to all attendees and were approved.	Motion to approve from K. Fodero 2 nd Y. L-- Baboud
AGENDA APPROVAL	The proposed agenda for this meeting from the Chair was emailed to all attendees and was presented. Agenda was approved.	Motion to approve from K. Fodero; 2 nd Y. Li-Baboud
Presentation & Discussion	<p>Discussion on including holdover time information in the PICS in the document: the Chair presented background material on holdover timing and time accuracy requirements from IEC 61850-5 and other standards (C37.118, etc.). See embedded slides, below.</p> <p>The PICS table as proposed (to include levels T1 – T5) was amended to make the PICS holdover entries mandatory rather than optional. Consensus of all members present to accept.</p> <p>Discussion of options 4a) vs 4b) in Table x in section 6.4 (Examples): consensus to use option 4a) with ensuing discussion on the number of days to update. Initial text was 42 days; the text was edited to include an assumed minimum 8 weeks advanced notice of an event and an example maximum validity time of 49 days, with validity time decremented daily (reset on receipt of a valid event message).</p> <p>Request the subgroup clean up the draft with today’s comments, and also clean up the Excel ballot-comment resolution file; ASAP so the full WG can review them before the next P1 meeting.</p>	C. Huntley and members

Item no.	Notes	Action by
Next steps	<p>Next meeting date (Webex) will tentatively be October 14, 2022. A meeting invitation will be sent out today. Note: this will be the WPRC week; please respond with availability</p> <p>The minutes for today's meeting will be distributed by email for review, to be voted on at that meeting.</p> <p>Edited documents will be sent to members.</p> <p>The agenda for the next meeting will be sent out. Any changes will be incorporated and the agenda will be re-sent if required.</p>	All
TIME OF FINAL ADJOURNMENT	11:46 CDT	Meeting adjourned.

From IEC 61850-5

If the connection with the network is lost, IEDs with slowly drifting time may keep the accuracy in the requested limit for some time and, therefore, may also act in this time span as master for other IED clocks.

11.3.4 Mitigation of clock failures

With the introduction of links or a bus (mostly the process bus) transporting samples of voltage and current from the sensors to the IEDs hosting protection or other application functions, the accuracy of sampling must be maintained despite of at least one single failure. Therefore, two redundant master clocks providing the time with the requested accuracy are needed. If one master clock fails, the other one takes over the synchronization. If the connection with the network is lost, IEDs with slowly drifting time may keep the accuracy in the requested limit for some time and, therefore, may also act in this time span as master for other IED clocks. The receivers of this high precision time like the merging units must know about the clock status to connect to the best reachable time source.

11.4.1 Time synchronization classes for time tagging

The application requires a certain sampling precision considering all sources of error, such as time reference, time synchronization protocol, internal clock synchronization and acquisition. Due to the statistical nature of synchronization, inaccuracy may be exceeded in rare cases. Table 1 specifies the time synchronization classes and different applications.

Table 1 – Time synchronization classes for time stamping respectively sampling

Time synchronization class	Accuracy [μ s] Synchronization error	Typical application
TL	> 10 000	Low time synchronization accuracy – miscellaneous
T0	10 000	Time stamping of events with an accuracy of 10 ms
T1	1 000	Time stamping of events with an accuracy of 1 ms
T2	100	Time stamping of zero crossings and of data for the distributed synchrocheck. Time tags to support point-on-wave switching
T3	25	Miscellaneous
T4	4	Time stamping of samples respectively synchronized sampling
T5	1	High precision time time-stamping of samples respectively high synchronized sampling

