PSMA Reliability Committee

TIME: Wednesday, 4/14/21, 11-12pm CST
PLACE: Zoom (669-900-6833 or 408-638-0968), 272 780 335, https://zoom.us/j/272780335
MINUTES: https://www.psma.com/technical-forums/reliability/meeting_minutes
ATTENDEES:

PRESENT?	COMMITTEE MEMBER
X	Mike Hayes, Tyndall – PSMA Representation (SPECIAL GUEST)
X	Brian Zahnstecher, PowerRox – Co-Chair
X	Joe Horzepa, PSMA – PSMA Representation
	Lisa Horzepa, PSMA – PSMA Representation
X	John Horzepa, PSMA – PSMA Representation
X	Ada Cheng, AdaClock – Member
X	Rick Fishbune, IBM – Member
	Patrick Le Fèvre, Powerbox – Member
	Tim McDonald, Infineon – Member
	Steve Miller, SL Power (*RETIRED*) – Member
	Kevin Parmenter, Taiwan Semi – Member
	Shane Callanan, AEI – Member
	Greg Miller, Silanna – Member
	Mike Seeman, Eta One Power – Member
X	Ed Massey, Ed Massey Consulting – Member
X	Eric Swenson, IBM – Member
X	Bill Mallory, SL Power – Member
	Shobhana Punjabi, Cisco – Member
	Hamish Laird, ELMG Digital Power – Member
	Francesco Carobolante, IoTissimo – Member
X	Nitish Agarwal, SL Power – Member
	Manish Bhardwaj, TI – Member
	Denis Downey, Cisco – Member

***** Attending APEC
GREEN = NEW MEMBER, 1st MEETING (i.e. – introduce yourself)
RED = REMOVING MEMBER, NO ATTENDANCE AND/OR RESPONSE FOR LONG TIME, PURGING
ACTIONS (w/OWNER) HIGHLIGHTED BELOW
ACTION COMPLETED

AGENDA:

IF ANYONE IS INTERESTED IN CO-CHAIR ROLE, THEN PLEASE REACH OUT TO BZ RIGHT AWAY.

- **New Comm Introductions / Membership**
  - Elevator pitch intros, roundtable.
    - NEW MEMBERS =
  - New Member Recruiting
    - Enough on plate for this year, WILL DEFER SURVEY TO END-'21 / EARLY '22.

- **Comm Website / Purpose Statement**
  - Comm website up and running on PSMA.com ADA REPORTS FULL PSMA WEBSITE REVAMP UP BY END-JAN

- COMM = IF HAVE ANY GOOD RESOURCES, LINKS, PAPERS, ETC. TO POST ON WEBSITE (REMINDER, OPEN TO PUBLIC), THEN PLEASE SEND TO BZ FOR POSTING VIA LISA.

- **Initiatives**
  - Revisit Committee Priorities
    - BZ WILL DISTRIBUTE THE ANNUAL SURVEY AND PREPARE RESULTS SUMMARY FOR NEXT MTG. Comm will have 1 wk to review initiative list and suggest any additions/deletions. Following that, there will 2 wk voting period in order to have final results prepared for next month's call.

  - **Power Supply Communication Bus Reliability (*BRIAN SPEARHEADS*)**

  - **PTR Webinars (*NEED NEW CHAMPION SPEARHEADS*):**
    - Topics? Speakers? Schedule? **FOR ANY WEBINAR, DECIDE IF PROPOSE TO PTR OR IF RELIAB COMM INDEPENDENT EVENT.**
      - COMM ACTION: WEBINAR TOPICS, PERHAPS FROM WITHIN COMM.
      - Bob White, Power Supply Communication Bus Reliability (pending special project activities ~~**COMING OFF HIATUS**~~). **INDEFINITELY POSTPONED**

      - **Doug Kirkpatrick, CEO, Eridan Communications**
        - "*System Reliability for Small Cells Enable 5G*"
        - **Consider for PTR webinar? BZ TO REACH OUT.** GIVING COMP TIME TO WORK OUT LOGISTICAL ISSUES FIRST, REVISIT IN LATER APR.

  - **APEC '21 INDUSTRY SESSION (*ED SPEARHEADS*** APEC 1/11/21 ACCEPTANCE NOTICE- RECEIVED, ACCEPTED!!! **3/26/21 FINAL PPT DUE TO APEC, COMM TARGET FIRST DRAFT BY 2/1/21 FOR REVIEW/ITERATION, ED TO GENERATE DETAILED COMM SCHEDULE): IS21 (~~Rm. 4 if F2F~~ NOW FULLY VIRTUAL), 6/11/21, TBD pm MST.** Ed now Co-chair for APEC session, thanks Ed!!! **ALL TALKS MUST BE PRERECORDED AND DONE ONLY THROUGH APEC'S TOOL (Social27 platform)!!! ED/BRIAN TO PROVIDE DETAILED INSTRUCTIONS.**
    - SCHEDULE
      - **12/08/20**: Speaker provides: Title, abstract, bio (completed)
      - **02/01/21**: Speakers provide presentation for review
      - **02/12/21**: Rel. Comm provides initial presentation feedback
      - **02/26/21**: Final session details submitted to APEC (entered into epapers)
      - **02/26/21**: Speaker provides updated presentation for review
      - **03/~~12~~ 5/21**: Rel. Comm completes presentation review and provides final feedback
      - **03/~~26~~ ~~12~~ 26/21**: Final presentation submitted to APEC (entered into epapers)
      - **04/26/21**: Final presentation RECORDING status check
      - **04/28/21**: Final presentation RECORDING submitted to APEC (entered into epapers)
    - Potential Speaker Chase List (TARGET CLOSE ON SPEAKERS/TOPICS BY END-NOV) –
      1. Ada suggests we consider highlighting collaboration efforts with IPC (particularly IPC-9592 or other investigation spearheaded by Rick/Eric). Aside from APEC IS, other calls to action likely to come out of this effort for us to track and turn into actionable

stuff, WILL CHECK-IN ON MONTHLY BASIS. PPT received and looking good so in great shape.

- "***IPC-9592B - What is it? What isn't it?***" from Eric Swenson, IBM
- ABSTRACT: *The IPC-9592 standard, "Requirements for Power Conversion Devices for the Computer and Telecommunications Industries," was first released in September 2008. This document defined design, test, and manufacturing requirements for various types of power assemblies from AC/DC converters to to battery packs. This standard covers requirements for each of these topics in varying degrees of detail. Specifics on qualification testing are especially well covered.* ***However, this standard has several omissions that need to be addressed. The development and testing of firmware is one important topic not addressed in this standard.*** *Another area where the standard could be strengthened is better defining manufacturing process requirements for each product class. This presentation will summarize the strengths and weaknesses of the current IPC-9592B standard and discuss various options to strengthen it.*

2. Crystal Yannarella, L3Harris Maritime Power Systems Division WAITING ON DRAFT PPT FOR REVIEW
   - "***Reliability of Electrical High Power Conversion and Distribution Equipment for Maritime Applications***"
   - ABSTRACT: In today's presentation I will touch upon a few major areas that contribute to some of the Martine industry's problems and challenges that plague large scale power delivery system reliability. These areas consisting of environmental conditions like moisture, corrosion, confined space limitations and how these conditions can affect the lifetime reliability of the system. I will also discuss system uptime reliability and the importance of thermal maintenance, and fault detection in relation to prolonging system health and longevity. I will also cover the important role that operational optimization and self-contained modular programmable construction plays in decreasing field maintenance time.
3. Mike Schnecker, Rohde & Schwarz
   - "***Wide Bandgap EMI Pre-Compliance for Reliability and Optimization***"
   - ABSTRACT: Demonstrating that SiC isn't noisy compared to silicon is a barrier to entry. SiC device and module manufacturers have surveyed their customer base and over 40% consider noise related to EMI issues to be a primary concern for adoption. This presentation will focus on the challenges associated with noise and the impacts on reliability when migrating a design from Si to SiC with discussion topics including test tools, test methodology, and mitigation and optimization techniques.
4. Ada notes PSMA newsletter (https://www.psma.com/HTML/newsletter/page17.html) recently highlighted iNemi article about the impacts COVID needs have on equipment reliability. BZ WILL FIGURE OUT WHOM TO SOLICIT FOR TALK PROPOSAL. BZ emailed iNEMI 10/14/20 with a follow-up 11/10/20 since no response to-date. PPT received and looking good so in great shape.
   - "***Recommended Best Practices for Protecting the Reliability and Integrity of Electronic Products and Assemblies when Disinfecting for SARSCoV- 2 (COVID-19)***" from Julie Silk, Keysight (on behalf of iNEMI)

  - ABSTRACT: The disinfecting procedures developed in response to the COVID-19 crisis could potentially have a detrimental impact on electronic equipment and assemblies. Many commonly recommended disinfection substances and/or application methods could potentially cause failures in electronic equipment if the internal electronics were inadvertently exposed to them. This is an obvious concern for electronics manufacturers who want to ensure the safety of their employees, supply chain partners and customers, while protecting the reliability and integrity of their products. A team of experts from across iNEMI member organizations reviewed key industry, government and technical sources and assembled a best practices document. The team assessed chemicals and common application methods, identifying those substances that minimize the risk of negative impact on electronic equipment when applied in an appropriate manner.

- **General**
  - Post-mortem PS SW/FW Reliability Report Update
    - Powerbox: given to design teams, lot of interest, inhibited by language barrier (Japanese in this case).
    - SL: given to teams, already have Reliab stakeholders involved, driving change in FW review process.
    - IBM: presented to some suppliers, neutral response so far, awaiting next major project kickoff for true assessment.
    - Patrick notes similar activities kicking-up within EPSMA, PATRICK WILL INQUIRE FURTHER TO SEE IF THERE ARE ADDITIONAL COLLABORATION OPPORTUNITIES. Patrick reports no response as of 10/14/20, 11/11/20, 1/13/21 (Patrick pinged again, expecting response).
  - Any other revenue-generating thoughts for PSMA?
    - Virtual Workshop (recent '20 Cap & Mag Virtual Workshop success as example)
      - Very well-received thus far, most seem to be ok with virtual format.
      - Joe notes guidance to reduce proposed event budget by ~20% for offset, F2F expenses, and pass through to attendee registration. Also, consider turning PS SW/FW Reliability Report into workshop theme.
      - Viability determined by success of existing webinar efforts.
    - Standards (primarily through conversion of existing project outputs)
      - Input into IPC-9592B standard update. Consider SW/FW input? Rick former colleague of IPC CTO (Matt Kelly), will work with IPC/PSMA efforts to cultivate opportunity here. BZ to facilitate email discussion with Mike Hayes as part of overall PSMA/IPC collaboration efforts. SW/FW report currently with IPC for review/feedback/suggestions. Eric also notes deep experience with this and interest in efforts. IPC currently reviewing with their committees to determine best course of action. ERIC/RICK CURRENTLY TRYING TO ARRANGE MEETING WITH IPC-9592 COMM TO DISCUSS COLLABORATIVE OPPORTUNITIES.
    - Offer supporting resources to enable utilization of PS SW/FW Reliability Report. COMM ACTION TO SUGGEST OTHER POTENTIAL RESOURCES/TOOLS TO CREATE TO SUPPORT THIS.
      - Ada reports there is a PSMA Automotive Electronics Webinar/Workshop that may be a good opportunity to highlight our PS SW/FW Reliability Report. Event

will occur no earlier than Aug. '21 (may push out) and even event logistics still TBD so continue to monitor.

- For example, extract a checklist from report to simplify barrier to entry (i.e. – team code review checklist). COMM ACTION (ADA SPEARHEADING) TO PROPOSE LIST OF POTENTIAL TOOLS FOR DETERMINING ACTIONABLE PRIORITIES. White paper? Checklist?
  1. Thoughts from Nitish: commonly challenged by disconnect between SW/FW & HW stakeholder expectations…could be helped by Process Checklist (for code reviews, functional flowchart/review, test plan, etc.).
  2. Thoughts from Ada: "Dashboard" of Metrics, Process Diagram, Prototyping & BIST…ADA WILL EMAIL LIST w/ DESCRIPTIONS. Ada sent analysis to Comm list 9/9/20, captured below for convenience (REVIEW NXT MTG):
     - **Those already in the report are as follows:**
       - * Sources of Coding Standards (p. 80)
       - * SW Development Process Audit Checklist (p. 85)
       - * Safety Assessment using a Risk Matrix to determine acceptable and unacceptable risks (p. 93)
       - * Regulatory inputs for software quality (p. 98)
       - * Example Software Quality Specification (pp. 98-100)
       - * Software Development Process Assessment Template (pp. 101-104)
       - * Software Security Assessment Specification (pp. 104-105) includes security checklist (also on p. 150)
       - * Digital PSU Verification Test Plan Example (pp. 106-109)
       - * Development Team Specifications (pp. 110-112) includes PSU Functional Partition Specification Template, & SW Interface Specification Template.
       - * Testing Checklist example (p. 159)

     - **Some proposed resources/tools that are not currently in the report:** **(COMM PRIORITIES)** BZ WILL PREPARE PROPOSAL FOR ADDRESSING BY NEXT MTG. Ada suggests once have enough of these tangible tools, introduce to industry via webinar and package tools (delivery mechanism for monetization TBD, ONCE TOOLS IN HAND, CAN REACH OUT TO MKG COMM FOR ADVICE).
       - * Process Flow Diagram **(1)**
         - Translate Hamish's text into more functional diagrams. MANISH CAN LOOK INTO CONTRIBUTING TO THIS TASK, BZ TO GENERATE FOCUSED EMAIL DISCUSSION TO DRIVE.
       - * Design checklist? **(2)**
         - Manish continues to refine flow chart, additional input from Manish & Ada…challenges in forming the flow chart and/or other deliverables. Nitish requests offline, focused discussion. BZ WILL FACILITATE MTG PROPOSAL OFFLINE AND SOLICIT COMM PARTICIPATION. Manish/Ada/Nitish held meeting 4/8/21. Now using tracker to facilitate mini project, TARGETING MONTHLY CALLS. PROPOSE WED, 5/5/21, 9 AM PST.

- Design review process resource doc from Ada = Design Review Based on Failure Mode (DRBFM) from Toyota: http://ceur-ws.org/Vol-566/C5_designreviewpatterns_ludewig_2009.pdf
- * BIST examples? **(3.1)**
  - Functional examples very enabling to new users.
- * "Dashboard" of metrics **(3.2)**
  - Propose hybrid dashboard of HW and SW metrics.
- * Code review checklist? **(5)**
  - Generate bulleted, process checklist.
- * Software release checklist? **(6)**
  - Generate template for release roadmap, examples and references.

- **Some inputs on the report for next phase/revision:**
  - * Add prototyping?
  - * Need to define code escrow

- **Next Meeting**
  - Tue 5/11/21, 11 am CST.
  - Regular Schedule = 2nd Wed of each month, 11 am – 12 pm CST