

Electronics Task Group Newsletter

September 2013

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From the Chair...

The October conference in Pittsburgh is rapidly approaching and we are a busy Task Group! This will be my last meeting as Chairperson then the leadership of the Electronics Task Group (ETG) passes to the capable hands of Richard Rumas from Honeywell Aerospace. I'm proud of the progress the Task Group has made during the past two years and am excited about the future.

Electronics is a growing commodity, recently adding two more auditors and, for the first time, will surpass 100 audits this year. We held a Supplier symposium at the Paris meeting in June 2013 to help prepare companies for their initial audits. And the number of Subscriber and Supplier Voting Members continues to increase.

In response to an Auditor suggestion we re-formatted our checklists from Procedural and Compliance sections to combining Procedural and Compliance questions by section (the 'P' and 'C' question format). Feedback has been positive and has improved the efficiency of the audit.

Working sessions have been instituted at most meetings. These sessions allow participants to break into small groups to address discrete topics in a face-to-face setting, thereby making more progress in a short amount of time. The small groups have also provided more opportunities for participation from all meeting attendees. Past working sessions addressed topics such as Conformal Coating, Lead Free and Mixed Metallurgy, Rework and Repair, ESD, Counterfeit Parts, re-aligning AC7119 with IPC-6012, Visual Acuity, and a major rework of AC7120. Session outputs are improved questions or new questions which are submitted for inclusion into the next revision of the checklist or as a future stand-alone checklist, as with Conformal Coat.

Looking forward, the Cable and Harness checklist, AC7121 Revision B, is being readied for ballot and release. The Conformal Coating checklist sub-team is resolving the last of the pre-ballot comments and the Printed Board checklist, AC7119, sub-team is making significant progress on its next revision. Work is beginning on AC7120 Revision C which will focus on question consolidation and incorporating the output of many of the working sessions.

Our checklists are a reflection of the electronics industry. As a Task Group we must work to incorporate the evolving standards, technologies, and regulatory challenges of the electronics industry including counterfeit parts, RoHS, REACH, and Conflict Minerals.

I would like to note the contributions of several people who have moved on to other positions and are no longer part of the Task Group: Philippe Pons (Airbus), Richard Rowe (Honeywell Aerospace), Suzanne Steketee (Ball Aerospace & Technologies), and Stephan Gehrke (Meggitt SA). Thank you for your support of the Task Group and much continued success in your new positions!

As the Task Group continues to mature, I encourage each of you to get involved beyond just preparing for your next visit from the PRI Auditor. We need your insight, experience, and knowledge of the industry to continually improve. Attend a meeting (www.pri-network.org/nadcap/ and click on 'Meetings') or join a checklist sub-team conference call which occur between meetings. I look forward to meeting you!

Scott C. Meyer – ETG Chair and Goodrich (UTAS) Representative



Conflict Minerals Legislation – Is Your Company Ready?

Over the past few years, the United States Congress has received reports that the mining and trade of certain minerals (designated as “conflict minerals”) in the Democratic Republic of Congo (DRC) and neighboring countries is being used to finance armed conflict and violence. Based on these reports, Congress undertook an effort to stop the flow of funds to these groups and curb the human rights violations in this region by exposing companies that use the materials refined from the mines located there.

In July of 2010, Congress passed section 1502 of the Dodd-Frank Act, which requires publicly traded companies to report on the sources of “conflict minerals” used in their products. The Securities and Exchange Commission adopted the final regulations to enforce the Act in August of 2012. These regulations have far-reaching effects on the electronics industry and its supply chain.

The regulations apply to the following minerals mined in the DRC: Casserite (refined to make tin metal), Columbite-tantalite (tantalum), Wolframite (tungsten) and gold. All four of the conflict minerals listed in the legislation are important constituents in the products and processes in the electronics industry. Gold and tin are common component finishes. Tin is a primary element in soldering alloys. Tantalum is used in electrolytic capacitors. Tungsten is used in semiconductor wire bonding. As a result, the conflict mineral legislation will have an effect on all companies that supply electronics.

Although the reporting requirements only apply to publicly traded companies, the information used to satisfy the reporting requirements of the act will be gathered from Suppliers at all levels in the supply chain. The requirements for gathering and reporting conflict mineral information are already starting to flow down from customers to Suppliers through purchase order terms and conditions and other flow down documents, so it is important that all electronic Suppliers develop a plan for meeting their customers’ inquiries.

Important elements of an implementation plan for compliance to conflict mineral regulations include:

- Establishment of clear organizational responsibilities for the conflict minerals program
- Writing a company policy statement for conflict minerals
- Identifying which products and Suppliers will be affected by the regulations
- Gathering data on these products and Suppliers in order to evaluate risks and prioritize activities
- Summarizing the data that has been collected in a form that can be transmitted to customers in a way that meets their needs, or reported in a way that satisfies the legislation
- Maintaining the program through regular review and changes as necessary

Reporting requirements outlined in the regulations state that public companies must disclose whether conflict minerals, or the metals refined from them, are necessary to the functionality of their products. These companies must also submit an annual report to the Securities and Exchange Commission stating what the company has done to investigate and monitor the sources of conflict minerals in their products. If any of the company’s products have been manufactured (internally or externally) using metals that are not “DRC conflict-free”, the company must specifically disclose the products, the smelter or refinery used to refine the metals, where the conflict minerals originated, and all efforts to define the origin of the minerals.

The first disclosure reports are due on May 31, 2014 and cover calendar year 2013. Requirements for an independent private sector audit of disclosure reports start in 2015; in 2017, all reports must be audited.

There are many sources available to help Suppliers get more detailed information about the conflict minerals legislation and to provide assistance in setting up a conflict minerals compliance program. The IPC Document, “IPC Conflict Minerals Due Diligence Guide” is a good place to start.

Doug Schueller – AbelConn LLC Representative

Counterfeit Components Avoidance Program

Counterfeit electronic components are causing major problems in the electronics industry. The problems affect production, warranty costs and safety of aerospace, military, medical electronics and many forms of consumer electronics. The safest way to avoid counterfeit components is to purchase them from the Original Component Manufacturer (OCM) or through their approved franchised or authorized distribution supply chain. This, however, is not usually the case, when the original component manufacturer has discontinued the component production.

What is the solution when encountering this dilemma? How can this be avoided prior to receiving components into stock at your facility?

A Counterfeit Component Avoidance Program (CCAP) was developed by Component Technology Institute to define mandatory practices for use by Independent Distributors (ID) to detect and avoid the delivery of counterfeit electronic components to their customers. The program allows users of electronic components to order components from certified ID with a higher confidence of being free of counterfeits. There are companies which provide this certification service as an unbiased and independent organization, which is not involved in the buying or selling of electronic components.

The following are a few examples of mandatory elements of this certification program:

1. Review and approval of ID inspection procedures
2. Audit of ID avoidance practices
3. Purchasing practices by ID
4. Component visual inspection, sampling and testing for remarking
5. X-ray Inspection of die and lead frame
6. XRF test of leads and solderability testing
7. De-cap and die inspection of samples
8. Electrical test of passive components
9. Electrical test of semiconductor and IC's
10. Selection and control of contract test labs
11. Counterfeit Avoidance Inspection Report

When an inspection sample fails any required inspection, at any stage of the inspection process, the lot shall be classified as counterfeit and shall not be considered further for acceptability.

In addition to the above initiative, organizations such as Ball Aerospace & Technologies, BAE Systems Inc., Honeywell Aerospace, Lockheed Martin, and Orbital Sciences Corp. have developed and implemented Counterfeit Parts Control Plans that document their processes used for risk mitigation, disposition, and reporting of counterfeit parts.

Reference Documentation:

- AS5553 – Counterfeit Electronic Parts, Avoidance, Detection, Mitigation and Disposition (For buyers/end item users)
- AS6081-Counterfeit Electronic Parts for Distributors
- BS PD IEC/TS 62668-1: 2012 Process management for avionics. Counterfeit prevention. Avoiding the use of counterfeit, fraudulent and recycled electronic components
- ISO -9001 Quality Management Systems
- ANSI/ESD S20.20-2007 – Development of an Electrostatic Discharge Control Program
- ANSI/NC SL Z540-1 – Calibration Laboratories and Measuring and Test Equipment

Frank Cristofol – BAE Systems Inc. Representative



Printed Board - AC7119 Update

The Printed Board sub team has been active over the past year. Printed Board Checklist AC7119 Revision E was released for use with audits conducted on or after 2 September, 2012. As more and more Suppliers are audited to the new checklist, we are developing a better understanding of the benefits of this new document. The reorganization of the questions to place the procedure and compliance questions together has been very well received and is promoting faster, more effective audits. Other changes include modifications to address the use of "Qualified NO", clarification of solder mask requirements, additional controls for electroless copper, and greater discretion to the Supplier for the control of age sensitive materials. Fewer findings are being voided and the new document has been a significant success.

In response to Nadcap Management Council's concerns about adherence to industry standards, a new revision of AC7119 is in work to bring it into closer compliance to IPC-6012. A draft document was presented in Paris in June 2013 where the concept was largely approved, but there was strong support for retaining the best of AC7119 Revision E. In addition there was the general realization that Nadcap performs process audits and IPC-6012 is a performance specification, making direct transition from IPC-6012 to a Nadcap audit checklist more challenging than initially envisioned. The plan is to further modify the questions from IPC-6012 to allow for a meaningful process audit and then begin to merge the old with the new. A draft of AC7119 Revision F is planned for presentation in Pittsburgh in October 2013. Additional plans are to update the handbook and add a slash sheet for IPC-6018 (High Frequency).

Barbara Waller – AC7119 Sub-Team Lead and Raytheon Co. Representative

Circuit Card Assemblies – AC7120 Update

The team has continued to work on continuous improvement of the AC7120 checklist for inclusion in Revision C. The vision for the future is to have a consolidated core requirements document that applies to all Circuit Card Assemblies (CCA) houses and then add slash sheets to facilitate stand-alone processes (such as Conformal Coating) and other large topics to aid the auditor and auditee. Further, it will be much easier to understand the scope of a Supplier; a quick glance at the approval should suffice since all slash sheets would be more readily visible.

Clearly this is a big change; therefore, the sub-team has decided that for the next revision of the checklist we are going to drive question consolidation (where this is thought prudent) and to incorporate the Conformal Coating slash sheet.

The Conformal Coating slash sheet is the culmination of several years of intense activity and is currently at the final draft ballot stage of the Nadcap process. Test audits will be arranged to confirm the slash sheet can stand on its own as well as attached to the core document.

The consolidation process is to combine a number of areas on a similar theme that appear throughout the checklist into one (or several, as appropriate) focused questions. Areas for review include MSD, Calibration, Preventative Maintenance, ESD etc.

We also have a proposal to study how the prevention of counterfeit parts is managed in a company; this will be available for ballot later in the year.

Roy Garside – AC7120 Sub-Team Lead and Rolls-Royce Representative

Cable and Harness Assemblies- AC7121 Update

The AC7121 sub-team has been hard at work this past year to complete updates to the Cable and Harness (C&H) checklist. Revision B of the checklist will be balloted soon to incorporate some significant changes. These changes are being made to consolidate sections to improve the flow and efficiency of the checklist and audit (e.g. consolidation of the Solderability, Wire Tinning, Gold Removal, Cleaning, and Soldering sections into one section titled Soldering; and consolidation of the material handling and environmental sections / questions into one section). Revision B will also introduce the concept of a minimum scope of approval (i.e. removing the option to "NA" certain sections, ensuring the general / core processes are included in all audit scopes). And finally, this update will address the repeated use of "Qualified NO" (documenting checklist errors) and other high hitter NCRs from audits to Revision A of the checklist.

Future sub-team work will include the review and incorporation of changes to IPC/WHMA-A-620. Revision B of this C&H industry standard, upon which the checklist is based, was released in October 2012. These changes will be implemented into AC7121 for Revision C.

I'd like to take this opportunity to thank all of the task group members on the AC7121 sub-team for their important contributions and hard work towards improving this checklist. Great work team!

Rich Rumas – AC7121 Sub-Team Lead, ETG Vice Chair, and Honeywell Aerospace Representative

Conformal Coat – New AC7120 Slash Sheet Update

The AC7120 Circuit Card Assemblies (CCA) checklist contains a Conformal Coating section for CCA manufacturers that conformally coat the CCAs they build. The Nadcap Electronics Task Group (ETG) identified a need to create a “stand-alone” checklist for Suppliers that perform Conformal Coating of CCAs but don’t manufacture the assemblies themselves.

The Conformal Coating sub-team utilized a comparison matrix to document all of the industry standard coating requirements contained in IPC-HDBK -830, NASA-STD-8739.1, Honeywell HPS1007 & IEC Conformal Coating specifications. Each of these requirements was reviewed to determine inclusion in the new stand-alone checklist. Once applicable questions were selected, the sub-team compared them to existing AC7120 Conformal Coating questions and initiated a question consolidation/reduction process with the goal of focusing on key Conformal Coating process characteristics and not increasing the time required to conduct the audits. All Conformal Coating related questions will be included in both CCA (for Suppliers that manufacture and coat their boards) and Conformal Coating (coating only Suppliers) stand-alone checklists.

The ETG debated using a slash sheet format for the Conformal Coating checklist similar to the AC7108/2 where applicable core items (ESD, etc.) are included in the stand-alone checklist and designated with a “*”. All questions with a “*” are duplicate questions from the AC7120 and are not required to be answered for Suppliers that were already audited to the core requirements during the CCA audit. Suppliers that perform Conformal Coating only would be required to answer all questions. The final format has not been determined.

The ETG established that the Conformal Coating checklist will not be completed for inclusion in the next revision of AC7120 (Revision C) but should be available for the following revision.

John Mastorides – Conformal Coat Sub-Team Lead and Honeywell Aerospace Representative

IPC Status of Standardization

This article is part of a continuing effort on the part of the Nadcap Electronics Task Group (ETG) to provide information to Nadcap Subscribers and Suppliers regarding the status of IPC Standards Development Committees and the related specifications.

Currently, the Nadcap audit checklists cover Printed Boards (PB), Circuit Card Assemblies (CCA), and Cables and Harnesses (C&H). The following is a summary of the status of standardization for each of these three commodities:

Commodity	Standard	Status
All	IPC-T-50K – Terms and Definitions for Interconnecting and Packaging Electronic Circuits	Released July 2013
PB	IPC-4552 w/ Amend 1 & 2 - Specification for Electroless Nickel/Immersion Gold (ENIG) Plating for Printed Circuit Boards	Released June 2013
PB	IPC-5703 – Cleanliness Guidelines for Printed Board Fabricators	Released May 2013
PB	IPC-A-600J – Acceptability of Printed Boards	Currently in work / meeting.
PB	IPC-6012D - Qualification and Performance Specification for Rigid Printed Boards	Currently in work / meeting, focusing on updating HDI / microvia requirements. The task group is also working on an amendment to revision C regarding test coupon designs for lot acceptance and conformance testing.
PB	IPC-6013C – Qualification and Performance Specification for Flexible Printed Boards	Final draft for industry review. Focusing on updating HDI / microvia requirements.
CCA	IPC-A-610F – Acceptability of Electronic Assemblies	Currently in work / meeting (planning for ballot by APEX in March 2014). Updates include new criteria for P-leaded devices and changes / clarifications for roll swages.

Commodity	Standard	Status
CCA	IPC-CC-830C – Qualification and Performance of Electrical Insulating Compound for Printed Wiring Assemblies	Currently in work / meeting to address new Conformal Coating materials and discussing an adhesion testing method. (Gage R&R required for new adhesion test method prior to inclusion). Also discussing the following topics: QPL for IPC-CC-830; new fluoro-polymers classification (vacuum deposition / dielectric voltage); conflicts between Mil-I-46058 and IPC-CC-830 (failed dielectric voltage (pattern/spacing)).
CCA	IPC-HDBK-830A – Guidelines for Design, Selection and Application of Conformal Coatings	Proposed standard for ballot.
CCA	J-STD-001F – Requirements for Soldered Electrical and Electronic Assemblies	Currently in work / meeting (planning for ballot by APEX in March 2014). Updates include: new humidity section with pointer to J-STD-033 for MSDs. (70% vs. 60%); solder ball void criteria changed to 30% / no reliability issues unless at interface; coating criteria for tin whisker mitigation (round robin group meeting separately).
CCA	IPC/JEDEC/ECA-J-STD-002D – Solderability Tests for Component Leads, Terminations, Lugs, Terminals and Wires	Released June 2013
CCA	J-STD-003C – Solderability Tests for Printed Boards	Currently being prepared for release by IPC fall meetings. This document will address more wetting balance data generation and provide improved solder float test and solder spread test protocols.
CCA	J-STD-006C – Requirements for Soldering Alloys	Proposed standard for ballot. Alloy impurities in solder bar stock: J-STD-001 & -006 have same limits; joint sub team to address.
CCA	J-STD-030A - Design, Selection and Process Implementation for Underfill Materials	Final draft for industry review.
C&H	IPC/WHMA-A-620B – Requirements and Acceptance for Cable and Wire Harness Assemblies	Released October 2012. Note: Amendment 1 released September 16, 2013.
C&H	IPC/WHMA-A-620BS – Space Applications Electronic Hardware Addendum to IPC/WHMA-A-620A	Released June 2013.
C&H	IPC-HDBK-620 – Cable and Wire Harness Design Guideline	Currently in work / meeting.
Other	IPC-A-630 – Standard for Manufacture of Electronic Enclosures	All ballot comments have been resolved by the committee. The final document is currently at the printer and will be released by the IPC fall meetings.
Other	IPC-HDBK-630 – Guidelines for Design, Selection and Application of Electronic Enclosures	First ballot produced negative votes and technical comments being worked. Will be balloted again after IPC-A-630 released.

Commodity	Standard	Status
Other	IPC-TM-650 2.3.43 - Standard Test Method for Evaluation of Material Compatibility, Cleaning	Developing a standard test method to replace Mil-Std-202G, Method 215K which does not accurately represent modern cleaning chemistries and the cleaning equipment advancements that are currently used within electronics assembly manufacturing processes. The new test method will determine the compatibility of cleaning agents and mechanical delivery systems with general electronic assemblies, component hardware, and electronic assembly materials. Key focus: Entrapped cleaning chemistry. Goal: create new spec for release by 2015.

Nadcap ETG members, including both Subscribers and Suppliers, are strongly encouraged to participate on IPC Standards Development Committees. Participating in these committees will allow your voice to be heard in shaping the industry through requirements definition, development of acceptance criteria, and sharing guidance / best practices through handbook writing and establishment of training curriculum.

These committees meet at regular IPC events, such as at IPC/APEX in the spring, and various other times throughout the year, as needed. There are no special requirements to attend. Simply show up and volunteer your time to make the industry better.

Upcoming Meetings:

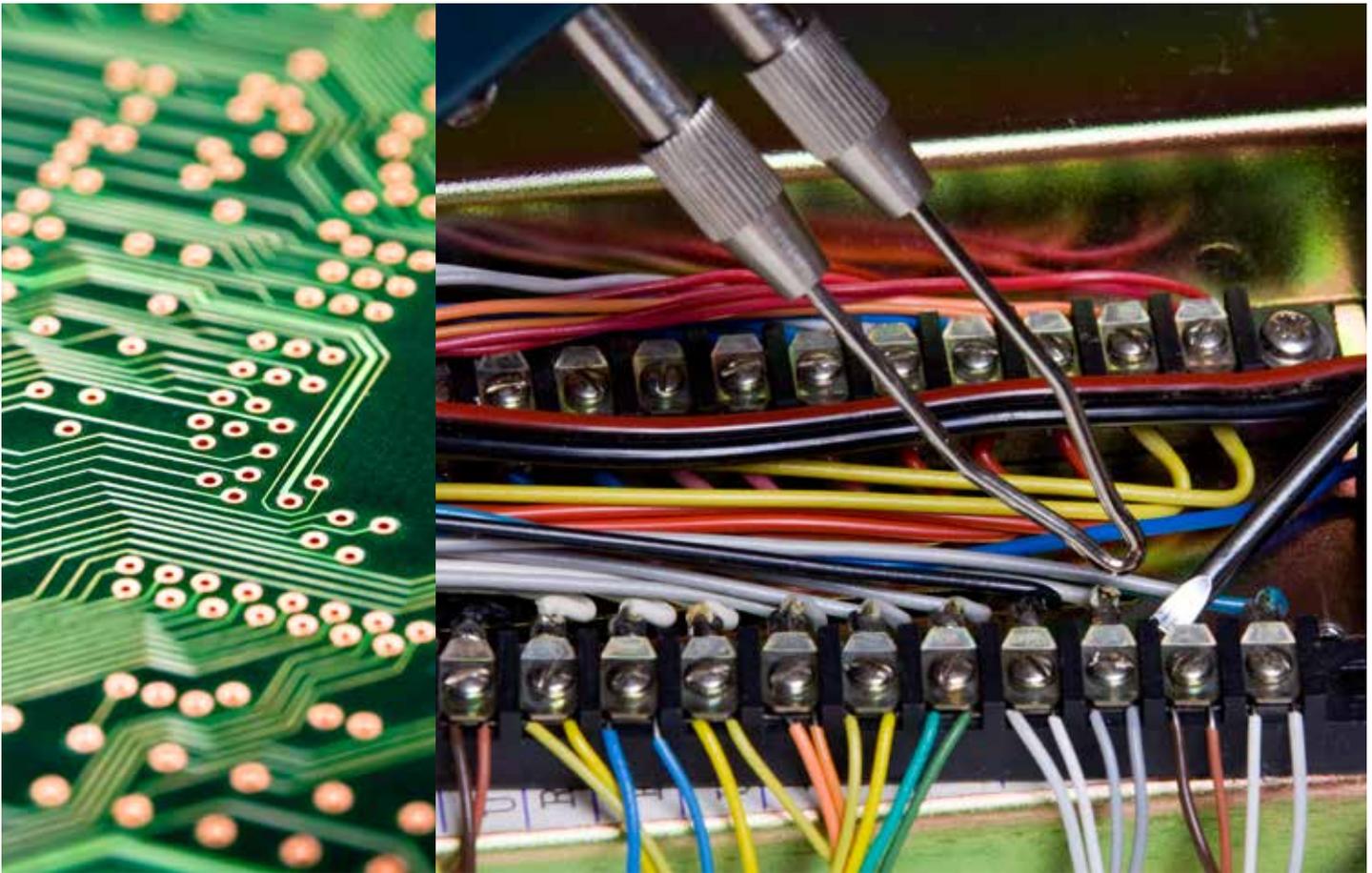
- IPC Fall Standards Development Meetings: will be co-located with SMTA International in Fort Worth Texas Convention Center, Fort Worth, TX on October 12-17, 2013.
- IPC APEX 2014: will be held in Mandalay Bay, Las Vegas, NV on March 22-27, 2014.

IPC Websites:

- Main site: www.ipc.org
- IPC committee home pages: www.ipc.org/CommitteePage.aspx
- Status of IPC standards: www.ipc.org/status.aspx
- Upcoming IPC meetings and events: www.ipc.org/IPCcalendar.aspx
- Industry ballots: <https://ipc.kavi.com/kws/public>

Richard Rumas – ETG Vice Chair and Honeywell Aerospace Representative





ETG Newsletter – Want to be on the Circulation?

The ETG newsletter is published periodically throughout the year. The newsletters are read by the Nadcap Subscribers, Suppliers, Auditors and anybody that happens to click on the latest ETG newsletter on the PRI website (www.pri-network.org). The aim of the newsletter is to communicate information relating to ETG within the Nadcap program to improve our process and to promote the sharing of best practices at all levels.

Have you stumbled across the ETG Newsletter by chance? Want to receive it on a regular basis? Keep up-to-date of the latest Nadcap ETG information by getting added to the distribution list! To receive notification when a new edition has been published, please e-mail Melanie Petrucci at mpetrucci@sae.org with your name, company and email address.

Nadcap Meeting Schedule

2013	
October 21-25	Pittsburgh, Pennsylvania, USA
2014	
February 24 - 28	London, England
June 23-27	Dublin, Ireland

Register online at <http://www.pri-network.org/nadcap/>

PRI Staff Contact Details

Name	Position	Location	e-mail Contact	Telephone
Bill Dumas	Senior Staff Engineer	PA, USA	billdumas@sae.org	+1 (724) 772-8673
Susan Frailey	Staff Engineer	IL, USA	sfrailey@sae.org	+1 (618) 615-4478
Melanie Petrucci	Committee Service Representative	PA, USA	mpetrucci@sae.org	+1 (724) 772-8642