

NEWSLETTER

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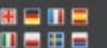
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Presidents Message



Dear Members, Affiliates and Friends,

This month, thanks to Tom Bishop, Senior Technical Support Specialist at EASA, we are happy to give you more details in our newsletter on the AR100, The EASA recommended practice for Motor and Generator, the unique standard that was developed by and for our industry, the main pillar of the successful Accreditation Program that was launched by EASA in September 2014 to respond to the demand from our industry of quality motor/generator repairs that maintains efficiency and ensures reliability, I would like to take that opportunity to share with you some of the benefits of standardization identified by some of the most important institutions : « Many studies and surveys have clearly demonstrated the economic benefits of standardization. A series of studies conducted in Australia, Canada, France, Germany and the UK, point to a direct relationship between the use of standards and economic growth, labour productivity, ability to export, and more.

International Standards have a positive influence on innovation, much as patents do, but the efficient dissemination of new technical knowledge via standards is a decisive factor and a precondition for economic growth. » IEC, International Electrotechnical Commission.

« The benefits of standards for European industry are extensive. Standards help manufacturers reduce costs, anticipate technical requirements, and increase productive and innovative efficiency. The European Commission recognises the positive effects of standards in areas such as trade, the creation of Single Market for products and services, and innovation. » European Commission,

“Using standards can offer a set of powerful business and marketing tools for organizations of all sizes. You can use them to fine-tune your performance and manage the risks you face while operating in more efficient and sustainable ways; they'll allow you to demonstrate the quality of what you do to your customers; and they help you to see how to embed best practice into your organization.” BSI, United Kingdom

“International Standards bring technological, economic and societal benefits. They help to harmonize technical specifications of products and services making industry more efficient and breaking down barriers to international trade. Conformity to International Standards helps reassure consumers that products are safe, efficient and good for the environment”. ISO, Benefits of International Standards

Around the world, we have already 60 EASA Accredited Companies. We need more companies in our Region to be EASA Accredited to support their business but also to strength our industry. Accreditation is important because it helps determine if a company meets or exceeds minimum standards.

Any questions on the AR100 or EASA Accreditation Program, please do not hesitate to contact Frederic Beghain, our General Manager or EASA Technical Support (Free for our Members)

I would like to use this last Newsletter in 2015 as Opportunity to thank all our Members, Affiliates, but also our General Manager Frederic, Sian, Carol, David and Johan and all others who helped us this year to develop EASA further.

I wish all of you a peaceful and happy end of this year and a very good 2016. We should think in a quiet moment to all of those who are not in such a lucky situation as we are, my wishes are with them.

Mathis Menzel, President of EASA European and World Chapter

Contentious Corner

In a recent article The Financial Times was reporting some of the following comments from Jeff Immelt, CEO of GE:

“He brushed off the risks of internet disruption to GE's own business, playing down the possibility that customers would buy less equipment as technology allows them to use their existing assets more effectively”

<http://www.ft.com/intl/cms/s/0/ae34d4ba-678a-11e5-a57f-21b88f7d973f.html#axzz3pDQaPUZ3>

What do you think? How this will influence your business? Where do you see the next big investment in our industry? Please let us have your views, your thoughts, and suggestions at secretary@easa9.org



Affiliates Article - ASEIN Main Carbon Grades

There is a specific carbon grade for each application. To assure the best commutation and to give the best performance of the carbon brush, it's essential to use the correct carbon quality that better adapts to the motor requirements. In Asein, we are proud of having more than 50 different carbon grades to fulfill any client need:

Hard grades

Hard grades made from amorphous carbon (retort coal, carbon black, coke) characterize because of their robust cleaning and long wearing. Normally used on commutators with flush mica and partially even with undercut mica. Applications: fractional h.p. motors, electrical tools, domestic machines up to 30 kW and up to 500 V, contacts and current collectors.

Carbon graphite grades

Grades with high electrical resistance and graphite structure are used for difficult commutation and high circumferential speed. Numerous fields of application result for these grades due to their good density values. Applications: high rotating domestic appliances, electrical power tools, electrical gardening tools.

Graphite grades

Carbon graphite brushes consist of various graphite and carbon materials, having weak grinding effect due to mineral ingredients. Mica must be undercut. The brush is able to grind off burnt spots on the commutator, whilst speed and brush fire are low. Applications: high speed machines, for turbo-alternator sliprings and D.C. machines, micro motors, fractional h.p. motors and dynamos

Resin bonded grades

High resistance, high transient voltage and large ratio of vertical and horizontal resistance, all facts which influence favourably the suppression of commutating currents. Applications: Schorch and Schrage type A.C. commutator motors, D.C. up to 30 kW auxiliary brushes for cross-field excitation, 3-phase commutator machines, repulsion motors, converters, fractional h.p. motors, thyristor controlled motors etc.

Electrographite grades

Made from pre-graphitized carbon material and converted into electrographite under temperatures of about 2500 °C for a prolonged period, thus freed from most impurities. The physical data such as resistance density, strength etc. are more favourable than those of hard grades. It has furthermore good commutation, consumption and short circuit proof features. Mica must be undercut. Applications: A.C. and D.C. motors, 3-phase commutators, traction motors, rotary phase converters, sliprings, arc welding, fractional h.p. motors, control dynamos.

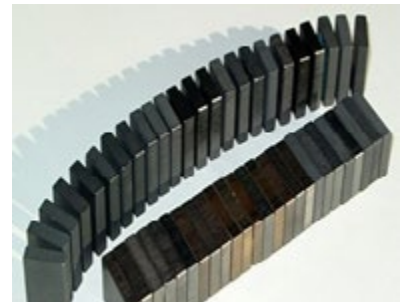


Metal graphite grades

Made from graphite and other carbons by adding copper and other metal powder. Excellent conductivity and low voltage drop. The current density is essentially higher than with graphite brushes. Applications: earthing brushes, D.C. low voltage machines, starters sliprings (exiters), synchronized asynchronous motors, sliding contact line, etc.

Silver graphite grades

Equivalent manufacturing process than for metal grades. Applications: contacts, transmission of testing currents, micro motors of low voltage, tachometers etc.

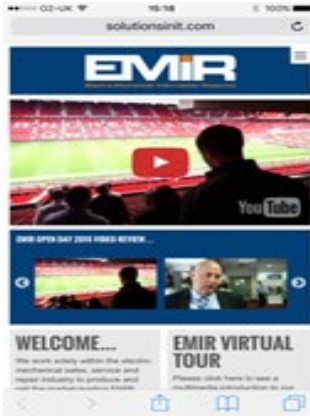


Thanks for this month's article goes to:-

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Affiliates Article - EMIR Software Launches New Web Site – www.emirsoftware.com

A company's web site is clearly a starting place for new prospects to get a feel for the business and when you are in the technology industry, the first few pages your potential client sees is a key milestone to building strong relationships. 'You never get a second chance, to make a first impression!'



"The design and the content of a web site can quickly become dated and fail to give users what they really need – a good feeling about the business and information they really want." explains Gary Downes, Director of software authors, EMIR.

Gary adds. "This time around we wanted to design something that was aligned to the brand, even easier to use and offered each visitor specifically something for them."

The new web site accommodates mobile compatibility so that information can be viewed from any device, wherever you happen to be. It uses video in the public facing areas of the site to highlight over 20 years of heritage and internally offering existing clients the opportunity to learn about new features and technology from a secure client area as soon as the product is updated.

Linked to EMIR social media activity and news posts, all visitors in the electro-mechanical industry will benefit from regular industry and trade association updates. www.emirsoftware.com/news

Existing EMIR users should contact 0845 009 4588 or email info@solutionsinit.com for access codes to the client area of the site, new content is being added daily.



You can find out more about EMIR (Electro-Mechanical Information Resource) by visiting their YouTube Channel – Now Showing:

- UK Client Testimonials
- A review of the EMIR Open Day 2015 at Old Trafford
- Apple iOS and Android application – Smart Site



<https://www.youtube.com/c/Solutionsinit>

EMIR, short for Electro-Mechanical Information Resource is an integrated business software solution designed specifically for the repair and service industry. With a 20 year pedigree and over 2,000 users around the world, EMIR handles job management, quoting, purchasing, stock control, asset history and finance from a selection of over 15 Modules and Extensions.

Thanks for this month's article goes to:-

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Whats New?



EU plans tougher motor efficiency regs – and to add VSDs

The European Commission wants to extend its energy-efficiency regulations affecting electric motors to save a further 22.3TWh per year across the European Union by 2030. The Commission is proposing to raise minimum efficiency levels on some types of motor, introduce regulations for smaller motors and for VSDs (variable-speed drives), remove the option to use VSDs with lower-efficiency motors, and extend the regulations to include specialised motors such as explosion-proof and brake types.

See more at: http://www.drivesncontrols.com/news/fullstory.php/aid/4949/EU_plans_tougher_motor_efficiency_regs_96_and_to_add_VSDs.html#sthash.j3TpWgzk.ltCKc4vZ.dpuf

Kit will help to develop drives and motor controls

Texas Instruments (TI) has announced a hardware and software kit that it says will make it easier to develop and evaluate drives for a variety of motor types, sensing technologies, encoder standards and communications networks. The DesignDrive kit can also be used to develop real-time Ethernet communications and functional safety topologies. The kit, based on the real-time control architecture of TI's C2000 microcontrollers (MCUs), can be used to develop industrial inverter and servodrives for applications such as robotics, CNC machines, elevators and materials-handling systems.

See more at: http://www.drivesncontrols.com/news/fullstory.php/aid/4810/Kit_will_help_to_develop_drives_and_motor_controls.html#sthash.49eTEgwo.aUMEdVvY.dpuf

News Extra: BP Statistical Review shows significant shifts in global energy production and consumption in 2014

The 2015 edition of the BP Statistical Review of World Energy, launched on June 10, highlights how significant changes in global energy production and consumption have had profound implications for prices, for the global fuel mix, and for global carbon dioxide emissions. The 64th annual edition of the Statistical Review emphasises the continuing importance of the US shale revolution, with the US overtaking Saudi Arabia as the world's biggest oil producer and surpassing Russia as the world's largest producer of oil and gas.

See more at: <http://www.hazardexonthenet.net/article/97184/News-Extra--BP-Statistical-Review-shows-significant-shifts-in-global-energy-production-and-consumption-in-2014.aspx>

India Could Realize Its Renewables Plans Earlier

India could realize its renewable energy plans in four and a half years, instead of the initially projected six years, the Union Minister of State for Power, Coal & New Renewable Energy, Shri. Piyush Goyal, said at a State Power and Renewable Energy Ministers' Conference in Kochi today. "I am confident that we can achieve the Renewable energy targets, not necessarily six-and-half years from now but possibly even in four-and-half years from now, if we all work together as a team," Minister Goyal said.

See more at: <http://www.offshorewind.biz/2015/11/06/india-could-realize-its-renewables-plans-earlier/>

Want To Be The Next Airbnb Or Uber? You Need To Understand The Sharing Economy

Critics of the sharing economy are piling on. Just this month a closely fought battle over Proposition F in San Francisco, also known as the "Airbnb Initiative," aimed to put serious restrictions on private, short-term housing rentals. Uber, meanwhile, faces nearly daily battles with legislators and protestors over the way it treats its drivers. Even the media is jumping on the bandwagon calling for changes to the way the sharing economy has evolved. But, even with all this strife, the sharing economy is just getting warmed up.

See more at: <http://www.forbes.com/sites/bijankhosravi/2015/11/07/want-to-be-the-next-airbnb-or-uber-you-need-to-understand-the-sharing-economy/>

Technical Article - EASA's Motor Repair Standard and Accreditation Program Assure Quality Repairs That Maintain or Enhance Performance, Energy Efficiency and Reliability



The EASA recommended practice for motor and generator repair—ANSI/EASA AR100-2015: Recommended Practice for the Repair of Rotating Electrical Apparatus—provides good practices for mechanical repair, rewinding (electrical repair) and testing that help apparatus rebuilders maintain or enhance the performance, reliability and energy efficiency of AC and DC motors and generators. The ANSI designation indicates that it is the American national standard for rotating electrical apparatus repair. The focus here is on the electrical aspects of AC machine repair that this standard recommends, and that form the basis of EASA's new service centre Accreditation Program. Many of the good practices in ANSI/EASA AR100 (Figure 1) that aid in maintaining motor reliability and efficiency were identified through a comprehensive "rewind study" that was published jointly in the U.S. and the U.K. in 2003 by EASA and the Association of Electrical and Mechanical Trades (AEMT).

End users who require service centers to comply with AR100 can be confident that repairs will conform with a recognized national standard—i.e., quality repairs with no shortcuts. Further, the good practice recommendations in AR100 cited here are mandatory requirements in the EASA Accreditation Program. Therefore end users who choose EASA accredited service centres have the assurance of an independent, third-party audit that these requirements will be met.

Rewinding - AR100 concisely states the requirements for a good practice rewind in only two pages, beginning with inspection of the windings (Figure 2) and squirrel-cage rotor bars and end rings. The rotor is an electrical component—the rotating secondary of a transformer, with the stator being the primary—so defective rotor bars or end rings could reduce output torque or cause vibration.

Winding Data - Exact duplication of the original winding's magnetic and thermal characteristics is crucial to maintaining motor performance, reliability and energy efficiency. AR100 therefore recommends recording and checking the accuracy of the "as-found" winding data before removing the old winding. It also advocates keeping the cross-sectional area of the conductors the same (or larger, if possible) in the new winding, and not increasing the average length of the coil extensions. These good practices will maintain or reduce winding resistance and losses, thereby maintaining or increasing winding thermal life and energy efficiency.

Stator core testing - The good practices for core inspection and testing in AR100 focus on detecting core degradation (e.g., shorts between laminations, which cause circulating currents that increase stator heating and losses). These include loop or core tests (Figure 3) before and after winding removal, investigation and assessment of any increase in core losses, and repair or replacement of damaged laminations. This helps identify a faulty core prior to rewind.

Winding removal - AR100 highlights best practices for removing (stripping) the stator windings without damaging the core/laminations. For instance, it recommends first thermally degrading the winding insulation in a temperature-controlled oven, while closely monitoring the temperature of the part (typically the stator). EASA's Accreditation Program exceeds this recommendation by limiting the temperature to 370°C. This helps protect the interlaminar insulation.

Insulation System - AR100 recommends that the insulation system of new windings be equal to or better than the original, and use only compatible components. Most new motors use class B (130°C) or F (155°C) insulation systems for random windings and class B (130°C) for form coil windings. Service centers typically achieve the "better than" option by using class H (180°C) for random windings and class F (155°C) for form coil windings.

Rewind procedure and slot fill - Regarding the rewind process, AR100 states that the new winding should have the same electrical characteristics as the original. This is best accomplished by "copy rewinding"—i.e., using the same size conductors (wire cross-sectional area); the same connection, number of turns per coil, and coil pitch(es); and the same coil dimensions as the original. One good practice in AR100 that can improve efficiency is to increase the wire cross-sectional area; this increases conductivity and reduces losses. Another is to reduce the average length of coil turns by reducing end turn length, which reduces winding resistance and losses. Guidance on how to repair squirrel cage rotors reinforces the need to maintain the machine's original performance characteristics (e.g., speed versus torque). This includes making certain that rotor bars fit tightly in the core slots; that bar-to-end ring connections are welded or brazed; that the rotor cage retains its original electrical characteristics; and that the rotor can withstand normal thermal and mechanical forces.



Figure 1. ANSI/EASA AR100



Figure 2. A random-wound stator damaged by contact with the rotor.



Figure 3. Core testing a stator prior to rewind.

Technical Article Continued

Winding impregnation - Properly applied, the varnish/resin treatment bonds winding components such as wires and slot insulation tightly together while ensuring good heat transfer from the winding to the stator core and to the cooling air. AR100 therefore stresses the importance of winding impregnation practices that include preheating the stator winding; and using a varnish/resin with an adequate thermal rating that's both compatible with the insulation system and suitable for the application environment. The good practice procedures in AR100 build quality and reliability into the repair. To verify the machine's ability to perform in accordance with its nameplate rating, for example, the document recommends careful inspection, followed by winding resistance, surge comparison and high potential testing. As explained later, these procedures can detect faults or anomalies that could cause premature winding failure.

Inspection - AR100 recommends that the windings and insulation system be carefully inspected before insulation resistance, surge comparison or high potential tests are conducted. The main purpose (and benefit) of doing so is to detect and correct existing damage or weaknesses that might escalate under test and possibly destroy a new or reconditioned winding.

Insulation resistance test - Following inspection, a constant test voltage is applied for one minute, and then the insulation resistance of the winding is measured in megohms (Figure 4). Use of a digital megohmmeter to check winding insulation resistance. AR100 recommends testing the insulation resistance of the winding prior to high-potential testing (which could damage or destroy a winding with weak ground insulation). The document provides test ranges for various machine ratings, as well as minimum insulation resistance values. If a winding doesn't meet these minimum values, a high-potential test should not be performed.

Surge comparison tests - Whereas insulation resistance tests apply only to the ground insulation system, surge comparison tests (Figures 5 and 6) can detect shorts within the winding—e.g., turn-to-turn, coil-to-coil or phase-to-phase. AR100 suggests a surge comparison test level of two times the circuit rating plus 1000 volts. This is innovative because this criterion isn't specifically dealt with in other standards.

A good pattern would appear as a single trace. High-potential tests. High potential testing stresses the insulation system of the winding conductors to ground; and AR100 cautions against using it without first obtaining acceptable inspection and insulation resistance test results. The standard provides test levels for new, reconditioned or not-reconditioned windings; as well as comprehensive tables illustrating AC and equivalent DC test voltages for various types of machines and components. For a new winding, the test level is the maximum value (100%) given in the tables. After machine assembly, the test level is 80% of the maximum. Both test levels are limited to one-time tests of a winding. That is, to prevent insulation damage, a winding may be subjected to each test level only once in its lifetime. If subsequent high potential tests are desired (or for reconditioned windings), AR100 suggests testing at 65% of the maximum (new winding) level. For windings that haven't been reconditioned, the document recommends limiting dielectric testing to insulation resistance tests—a good practice that could prevent a winding failure under test.

No-load testing - Following repair and assembly, a motor is usually no-load tested (Figure 7). AR100 provides details on tests that should be performed at this critical point. For example, the exact operating speed should be checked, typically with a digital tachometer, and compared to the nameplate speed.

Instrument calibration - The testing section concludes by stressing the importance of another good practice—having instruments calibrated to a national standard at least annually. This helps service centres avoid such issues as a winding failure due to a high potential tester that outputs a higher voltage than indicated.

Conclusion

Although this article focuses on the electrical aspects of AC machine repair, the ANSI/EASA AR100 standard also provides good practices for DC machine repair and mechanical repair of rotating electrical apparatus. By following these procedures, service centres assure end users that they are receiving quality repairs that are performed in accordance with a recognized standard. And those who choose EASA-Accredited service centres have the added assurance of independent, third-party audits that AC motor repairs will maintain or improve the performance, energy efficiency and reliability of the machine. To view or download the ANSI/EASA AR100 2015 standard, go to www.easa.com/MaintainingMotorEfficiency Information about the EASA Accreditation Program is also available at www.easa.com/accreditation

About the author Thomas Bishop, P.E., is a senior technical support specialist at the Electrical Apparatus Service Association (EASA), St. Louis, MO; 314-993-2220; 314-993 1269 (fax) easainfo@easa.com EASA is an international trade association of more than 1,900 firms in 62 countries that sell and service electrical, electronic, and mechanical apparatus. For more information, [visit www.easa.com](http://www.easa.com)



Figure 4. Use of a digital megohmmeter to check winding insulation resistance.



Figure 5. A form coil stator being surge tested.

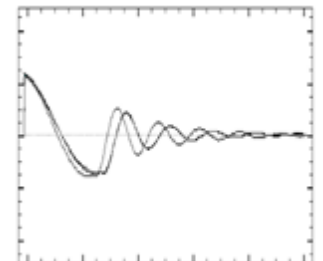


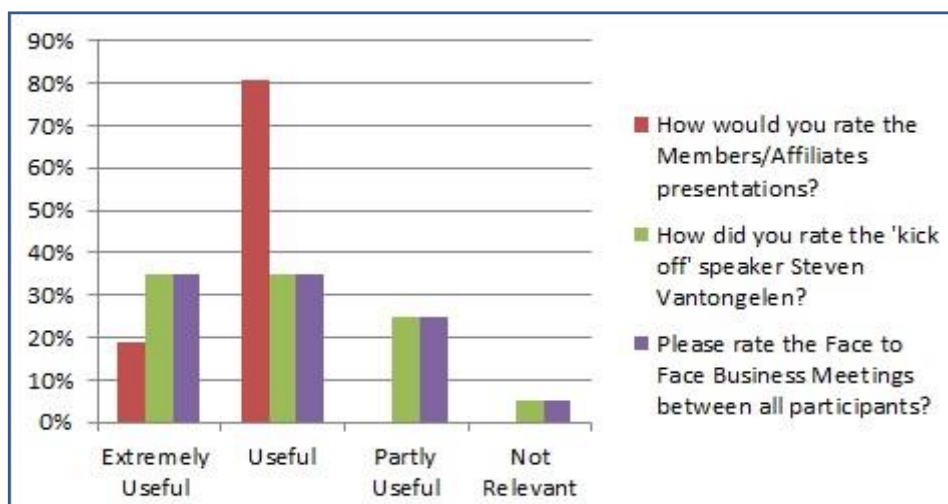
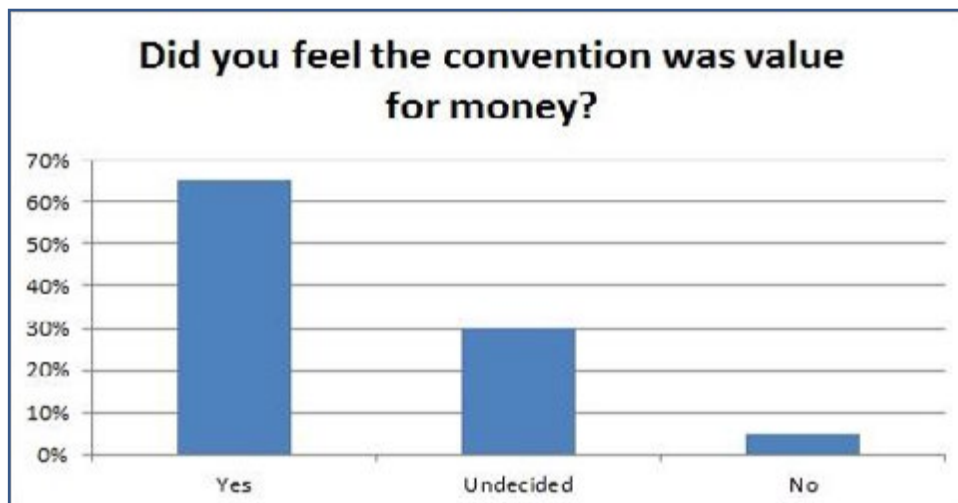
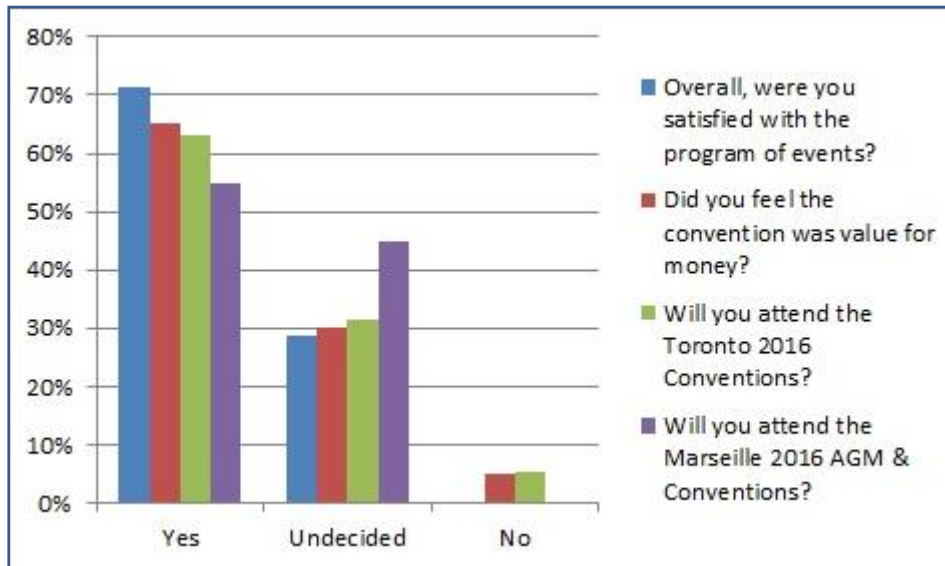
Figure 6. An example of a faulty surge test pattern. A good pattern would appear as a single trace.



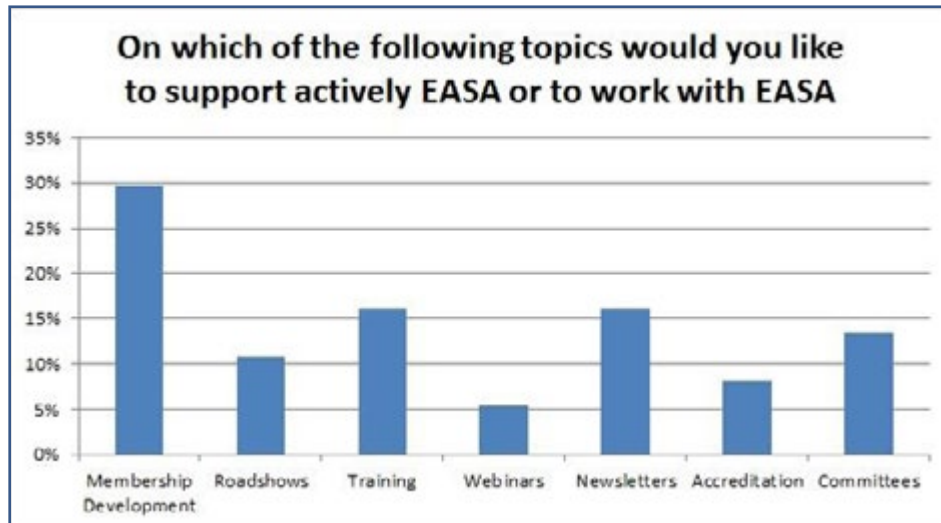
Figure 7. A motor on the test bed ready for its final test run.

Barcelona Convention & AGM Survey Feedback

Thank you to everyone who took the time to complete the survey (Almost 50%). Below, please find the Feedback from some of the questions that were asked:



Barcelona Convention & AGM Survey Feedback



We also asked for any other comments, please see some of them below....

Some of the Comments on the Program of Events:

- Next time may be good to ask all to share their presentations
- As an affiliate attending as a stand in- an early introduction to the rest of the group would have been good.
- Overall both my wife and I were extremely pleased with the venues the timing of the business sessions
- I enjoyed the question & answer session with the panel and getting the views of a customer was extremely interesting.
- I thought the programme of events was good and the balance between work and free time just about right
- Very good convention
- Yes...very happy and very useful, thank you!

Some of the general Comments

- Great venue, hotel good but not the best we have stayed in. Overall a resounding success thank you
- Information available for local tours or just information to contact a car for site seeing on your own
- I found the event interesting, informative and once I got to know the group - a lot of fun.
- I come to meet old friends and meet new ones but it is expensive when you put all the costs of travel, accommodation on top of the EASA fee. I do not know if others are influenced not to come because of this. For me the whole experience is still worthwhile and the organization is much better than in the past.
- As a lecture technique also would be interesting Very satisfactory in total

Thanks to our fellow EASAns for 2015 Membership and Support!

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