



Welcome to the October 2019 issue of the Newsletter, your local provider of information and learning opportunities related to quality professionals.

**Notice:** The section is actively looking for volunteers willing to serve on the leadership committee. If you are willing to volunteer, please send an email letting us know your willingness to serve to [Officers@asq1401.org](mailto:Officers@asq1401.org) with a subject of "Willing to serve on the leadership committee."

**Be sure to carefully read the location instructions below and arrive NLT 6:25 to be able to participate in the tour.**

### **General Membership Meeting**

**DATE:** Wednesday, October 16, 2019

**SCHEDULED TIME:** 6:30 PM to 8:00 PM

NOTE: Be sure to be at the security gate [see location instructions below] no later than 6:25 as everyone must view a 20 minute safety and security video prior to being permitted to enter the facility.

**LOCATION:** Freeport-McMoRan Rod and Refinery  
897 Hawkins Blvd. 79915

**SPEAKER:** Juan Sanchez

**TOPIC:** Production of copper rod for electrical applications according to ASTM B49

### **LOCATION INSTRUCTIONS:**

Below is a map showing that the entrance to the facility is at the end of a long driveway. The driveway takes you between several large storage tanks. Please do not enter via the 850 Hawkins or the 6999 N. Loop entrances. If you use Google Maps or Apple maps, they will take you closer to the 850 Hawkins entrance. Be on the lookout for the sign shown on the second attachment. At the end of the long driveway, there is a security building. Please park in front of it and walk into security to check in.



Figure 1 Map of entrance route



Figure 2 Entrance sign on Hawkins BLVD



**THE CHAIR SPEAKS**  
**EVARISTO CAMPOS-TORRES**

Hello, Fellow Quality Professionals!

I hope everyone is doing well.

A few months ago, Toro Manufacturing opened its doors to our ASQ chapter, and we were able to see interesting processes and products they manufacture. Last month Toro opened their doors again, but this time we learned about the operations at the Toro Distribution Center. It is the largest Toro distribution center in the region. We were impressed with their implementation of 5S and their culture. They manage products manufactured in the US, Mexico, and China, including mowers, blowers, and irrigation systems, among others.



**Toro leaders receiving the ASQ appreciation award**

This month we will have the opportunity of visiting the Freeport-McMoRan Rod and Refinery plant, where we will be able to learn about the production of copper rod for electrical applications process. I am sure we will find it interesting.

I hope to see you there!

Best regards,

***Evaristo Campos-Torres***

Chair, ASQ Greater El Paso Section 1401

## **AUTOMOTIVE SECTION**

HECTOR LUGO

Thank you to the participants in this exciting field. The winner of this month is the following: The Lamborghini Sián (pronounced “Shaan”) sports car, which debuted at the Frankfurt Auto Show last week, is the industry’s first supercapacitor-based hybrid. A 48-V e-motor delivering 34 hp is incorporated into the gearbox to provide immediate response and improved performance. It is claimed to be a first application where a low-voltage hybrid has a direct connection between the electric motor and wheels so that the e-motor can take on the strain during low-speed maneuvers such as reversing and parking.

The car’s Sián moniker, meaning “flash of lightning” in the Bolognese dialect, denotes the first electrification of a Lamborghini production car. While most hybrids use electric motors to downsize the accompanying gasoline engine, in this case Lamborghini combines it with a massive V12 engine. It incorporates titanium intake valves and is rated at 785 hp (577 kW) at 8,500 rpm—the highest output ever from a Lamborghini power plant. Combined with the additional 34 hp from the hybrid system, the Sián delivers a total of 819 hp (602 kW), enabling it to reach a top speed of over 350 km/h (217.5 mph).

See you at the meeting!

## **EDUCATION SECTION**

KIM PRIES

I must serve on a Federal Grand Jury the first two Wednesdays of each month through June of 2020 (wow!). Grand juries have the task of approving/rejecting subpoenas as well as the more usual task of ascertaining whether the presenter has provided enough evidence for the government to proceed to a petit jury trial.

What has been rewarding is seeing the outstanding preparation federal agents put into their work. I have served on county juries, and seen cases ineptly presented and with sketchy evidence.

In the education business, we require evidence to provide grades, which, in turn, provide feedback to students about their proficiency at specific tasks. Some of the educational advice is what I call “lore,” which is based on years of hearsay, and occasionally, mythology. However, a lot of information

in the education arena is based on solid research (e.g., John Sweller on cognitive load and John Hattie on feedback and the meta-analysis to end all meta-analyses).

I have evidence that tools like FMEA and QFD are very weak, which is unfortunate. I would like to see designed experiments that take these great-sounding ideas and put some muscle into them. Right now, they are mostly documentation you did what you were “supposed” to do.

Human Resources is another area for improvement. We have all done annual evaluations, yet I remember seeing a Robert Half journal article showing that in ~75% of the cases with employees, the decision went against the company. Telling somebody how they are doing annually seems like a waste of time since effective feedback is immediate.

Check it out!

## **MANAGEMENT SYSTEMS**

ALFONSO ENRIQUEZ

*This topic is about Dimensional Analysis and Design of Experiments.*

The scatter plot is one of the basic quality tools, it is made of the dependent variable  $y$  and the independent variable  $x$ , then we have the line of best fit or regression line which in the case of a linear relationship can be expressed as  $y = \beta_0 + \beta_1 x + \epsilon$ . We could have several independent variables associated with the independent variable through the multiple regression:

$$y = \beta_0 + \beta_1 x_1 + \beta_2 x_2 + \beta_3 x_3 + \dots + \beta_p x_p + \epsilon$$

Most of the models for the design of experiments have a form of single or multiple regression, some including additional terms for interactions.

A book on Chemical Engineering<sup>1</sup> states that “Dimensional Analysis drastically simplifies the task of fitting experimental data to design equations where a complete mathematical treatment is not possible.” Gearheart<sup>2</sup> wrote: “A key ingredient in designing products that are more robust is a thorough knowledge of the physics of the ideal function of those products and the physics of the failure modes of those products” Albrecht et al<sup>3</sup> state “DA experiments are underused because very few statisticians are familiar with them.”

Shen et al<sup>4</sup> demonstrate the use of Dimensional Analysis with three practical examples. One of the examples used a paper helicopter to design an experiment, where the objective is to reduce the flight time from a given height to the ground.

With dimensional analysis, the number of runs was reduced to 4 runs instead of previously reported experiments with 9, 64, and 128 runs. The Dimensional analysis starts by selecting the physical variables and form the transfer function: velocity:  $v = f(\text{mass of helicopter: } m, \text{ acceleration of gravity: } g, \text{ air density: } \rho, \text{ wing length: } r)$  this is one dependent variable and 4 independent variables, but using dimensional analysis it is changed to one independent variable and one dependent variable

$$\phi v = v / r g = h / (\sqrt{gr}) \text{ and } \psi m = m / (r^3 \rho)$$

The final equation is obtained as the following form:

$$\phi v = g \psi m, \text{ a single regression}$$

It is worth investing some time in studying Dimensional Analysis and gain future savings on DOE.

<sup>1</sup>McCabe, W.L. and Smith, J.C., "Unit Operations of Chemical Engineering," McGraw Hill, 1976

<sup>2</sup>Gearheart, C. "Using dimensional Analysis to build a better transfer function," SAE Technical Paper, 2004-01-1129

<sup>3</sup>Mark C. Albrecht, Christopher J. Nachtsheim, Thomas A. Albrecht & R. Dennis Cook Experimental Design for Engineering Dimensional Analysis, Technometrics, August 2013.

<sup>4</sup>Shen W, Davis T, Lin D, Nachtsheim J., "Dimensional Analysis and its applications in Statistics," Journal of Quality Technology, Vol 43, No. 3, July 2014

## **RE-CERTIFYING AND ASQ CERTIFICATIONS**

STEVEN SCHAFER

To be published online as available.

## Projected Events

2019	Month	Date	Day	Event	Location
	October	16	Wednesday	General Membership Meeting	Freeport-McMoran Rod and Refinery 6999 North Loop Dr. 79915
	November	6	Wednesday	Leadership Committee Meeting 6:30 pm	Good Coffee Restaurant 6101 Montana Ave. 79925
	November	20	Wednesday	General Membership Meeting	Hilton Garden Inn University 111 W. University Ave.

## 2019 Officers/Committee Chairs

<p>Chair: Evaristo Campos-Torres  Work Phone: (915) 860-6287  Cell Phone: (915) 929-3142  e-Mail: <a href="mailto:evaristo.campostorre@dish.com">evaristo.campostorre@dish.com</a></p>	<p>Vice-Chair – Auditing Chair: Mark Aldred  Phone: (575) 343-2182  e-Mail: <a href="mailto:aldredAerospace@gmail.com">aldredAerospace@gmail.com</a></p>
<p>Treasurer: Rebecca Diaz  Cell Phone: (915) 321-0279  e-Mail: <a href="mailto:rbkgomez@yahoo.com">rbkgomez@yahoo.com</a></p>	<p>Internet Liaison: Jack Vaughn  Home Phone: (915) 594-6662  Cell Phone: (915) 549-2014  e-Mail: <a href="mailto:jvaughn@utep.edu">jvaughn@utep.edu</a></p>
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<p>Immediate Past Chair: Sergio R. Vega  Work Phone: (915) 860-6257  Cell Phone: (915) 276-1130  e-Mail: <a href="mailto:sergio.vega@dish.com">sergio.vega@dish.com</a></p>	<p>Refresher Classes/Workshops Chair: Hector Lugo  Phone: (915) 208-2502  Home Phone: (915) 581-8091  e-Mail: <a href="mailto:h7tetor@hotmail.com">h7tetor@hotmail.com</a></p>
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<p>Recertification Chair: Steven Schafer  Home Phone: (915) 241-4780  e-Mail: <a href="mailto:spikeguate@sbcglobal.net">spikeguate@sbcglobal.net</a></p>	<p><b>Business Student Section: Vacant</b>  <b>Cell Phone:</b>  <b>e-Mail:</b></p>
<p>Education: Alfonso Enriquez  Work Phone (915) 231-4571  e-Mail: <a href="mailto:alfonso.enriquez@att.net">alfonso.enriquez@att.net</a></p>	<p><b>Partners In Education: Vacant</b>  <b>Cell Phone:</b>  <b>e-Mail:</b></p>