
**DECEMBER
2006**

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**Be sure to visit our section
website:**

<http://www.asq0905.org>

Section 0905 Mission Statement

The mission of Section 0905 is to develop and provide a strong organization for exchanging knowledge and ideas necessary for the growth and development of quality professionals in a manner that benefits the membership, business, and the Northeast Indiana Community.

Mailing Address:

**American Society for Quality
Northeastern Indiana Section 0905
P.O. Box 11887
Fort Wayne, Indiana 46861-1887**

The Histogram

N e w s l e t t e r

Next ASQ 0905 Dinner Meeting

December 14th

Wines: Which to Serve???

Join your ASQ associates for an enjoyable evening of great food and wine. Bring your spouse, a friend, or both.

Date, Time and Place

Thursday, December 14th Social gathering at 5:30. Program starts at 6:00.
Latitudes, 538 E. Dupont Rd, Fort Wayne, 46825

Directions

From I -69 Take exit 116 West onto Dupont Road.
Continue west past Dupont Road/Coldwater Road stoplight.
Turn left into Dupont Crossing and then right at the stop sign.
Located behind the Dupont Library. Enter thru the door on the east side of the building.

Dining and Dessert

Panchetta Bruschetta, Artichoke Chicken Roulades, Mini Beef Wellingtons, Marinated Vegetable tray, Fresh Mozzarella, Grape Tomatoes, Artichoke Cheese Bread.
Chocolate Dipped Strawberries, White Chocolate Raspberry Bars, Cheesecake Bars dipped in Chocolate. Coffee and tea will also be available.

Wines

A variety of red, white, and dessert wines will be served with the meal.
Trenia will lead a discussion on her choice of appropriate selection of wines

Our Hosts

Lisa Jackson brings over 20 years of experience in preparing and serving some of the finest food in Fort Wayne. She is the owner and manager of the Bagel Station. Don't let the name fool you. The variety and quality of the food is outstanding. Quite simply, Lisa Jackson and her expert chefs provide the best from scratch food products in the city.
Trenia LaRose is the bar manager at the Oyster Bar on Dupont Rd. She will be providing the wine selections to accompany the food as well as leading discussion regarding wine types and food-pairings. Prior to joining the Oyster Bar she was a pharmacist, so I'm sure she is an expert at doing whatever it takes to make the customer feel their best.

Reservations

Please RSVP by Monday, December 11th
Mark Maffey
260-434-5410
r.mark.maffey@baesystems.com

\$20.00 What a deal !!! Limited seating – Make your reservations early.

If you have a change in plans, please have the courtesy to notify Mark of the cancellation. We are charged for all reservations whether or not you show up.

To check out other events going on at Latitudes go to: <http://www.latitudes538.com/>

Excellence Conference

As I write this article, the conference was held yesterday.

Approximately 130 people attended this fourth annual conference. The next conference is already scheduled for November 15, 2007 so mark your calendars now!!

I especially enjoyed Scott Lassiter's presentation of standard accounting practices and how they should not always be used to make decisions. Another favorite speaker was Kris Thieker. Kris is one of the smartest ladies I know and always tries to understand what the audience wants from the short time we have with her.

Of course the Chocolate Fountain was a huge success. And we had more door prizes than ever this year with the top prize being a \$100 gift certificate to Cork N Cleaver!

To all who attended: congratulations on advancing your knowledge with this all day event. With 5 sessions plus the luncheon lesson with key note speaker Scott, I know you learned a lot. To all who did not attend: see you next year!

RECENT CERTIFICATIONS

Below are the names of individuals who passed the October 2006 exams. Congratulations on this milestone in your career!

Come to the next dinner meeting and get a FREE DINNER!

Certified Quality Inspector

Lisa A. Messer

Certified Six Sigma Black Belt

Karen J. Hughes
Toby L. Popenfoose
Todd Freeman

Certified Reliability Engineer

Jeffrey R. Newcomer

Certified Quality Technician

Jennifer L. Shepherd
Linda Kay Bussard
Delphur Lewis
Charles D. Collins
Kimberly J. Lucas

Manager of Quality/Organizational Excellence

Jeffrey E. Edmond
Tonya G. Redd

Recertification Contact Person

Mr. Chuck Bandelier
3543 E. Arabian Drive
Columbia City, IN 46725
260-429-5774
bandel@netusa1.net

The importance of maintaining the currency of your hard-earned certifications by using continuing education credits or other acceptable credits can not be over stated. Do not send recertification paperwork to the Section's mailing address, as the timeliness of your recertification may be lost. Paperwork should be sent directly to Chuck. If you have any questions about the material required to verify your recertification, call Chuck. remember the other way to retain your certification is to simply retest. I don't know anyone who wants that option.

Interested in advertising in the Histogram? The Histogram is published from September thru May. The charge is as follows:

1/4 page advertisement \$25.00/each month

1/2 page advertisement \$50.00/each month

Whole page advertisement \$100.00/each month

Contact Leslie Zody at 260-244-2114 or
leslie.zody@autoliv.com for more details.

SCHOLARSHIP TIME

It is scholarship time again! This year the Northeastern Indiana ASQ section 0905 will again be awarding scholarships to deserving individuals. These scholarships will be awarded on criteria including enrollment in a qualifying major, grade point average, financial need, extra curricular activities, and presentation of the application. Applications and official transcripts must be received by February 1, 2007. The scholarships will be awarded during the March meeting. A copy of the application is included on the next page.

**ASQ SECTION 0905
SCHOLARSHIP APPLICATION
DEADLINE FOR SUBMITTING: (FEBRUARY 1 OF AWARD YEAR)
MAIL TO:
Milt Gallmeyer, SCHOLARSHIP CHAIRMAN
6548E 1000N
Ossian, IN 46777
Email: mgallmeyer@generalaluminum.com**

1. MEMBER'S NAME _____

LAST	FIRST	MIDDLE
------	-------	--------

 ADDRESS _____
 CITY _____ STATE _____ ZIP CODE _____
2. NUMBER OF YEARS OF ASQ MEMBERSHIP _____
3. STUDENT NAME _____

LAST	FIRST	MIDDLE
------	-------	--------

 ADDRESS _____
 CITY _____ STATE _____ ZIP CODE _____
4. UNIVERSITY ATTENDING _____
5. CLASS STANDING CHECK ONE: ___ SO ___ JR ___ SR
6. NAME OF DEGREE PROGRAM _____
7. HOURS COMPLETED* _____ SCHOLASTIC AVERAGE _____
PLEASE ATTACH LATEST OFFICIAL COLLEGE TRANSCRIPT (REQUIRED)-2.70/4.0 MIN. REQ.
8. I WOULD LIKE TO RECEIVE THE SCHOLARSHIP BECAUSE (INDICATE NEED) _____

9. LIST ALL OTHER SCHOLARSHIPS AND AID YOU WILL RECEIVE FOR THE ACADEMIC YEAR

10. UNIVERSITY EXTRACURRICULAR/COMMUNITY ACTIVITIES (PLEASE LIST) _____

ELIGIBILITY for one annual \$800 renewable scholarship (Limit of three)

1. Must be sponsored by an active ASQ Section 0905 member in good standing, and have completed one academic year * prior to the applicable date and who will be a full time student (12 sem. hrs. or more) during award use.
2. Must be enrolled in a program leading to an Associate, or Bachelors degree in Engineering, Technology, Physical or Natural Sciences, Mathematics, Statistics, Business-Administration., Health Sciences, and Education at a recognized (ABET or equiv. accredited) college or university.

*** (30 Sem. hrs. or 45 Qtr. hrs. minimum)**

APPLICANT'S SIGNATURE _____

DATE _____

NOTE: Winner selection will be made at the February Board meeting.
NOTE: SCHOLARSHIP WILL BE AWARDED DURING THE REGULARLY SCHEDULED MARCH MEETING
 (Rev.10-10-06)

QUALITY PROCESS UPDATE

DECEMBER 2006

QUALITY POLICY DEPLOYMENT PROCESS



STRATEGY

Follow Through: Fallacy of the Commons

Remember the fallacy of the commons states that something might work well for one or two groups, but when everyone does it, it fails and everyone suffers. The classic tale is one shepherd grazes his sheep on the lush grass of the village commons. His neighbor does the same, and his sheep also fatten up wonderfully. Soon the whole town is grazing there, and the grass is clipped so short that it dies. Every sheep in the town then starves.

Last spring QPU reported on the trend towards getting the absolute best employees. Each was to be a perfect fit for each position. One of the biggest advocates was Google. Many firms were following Google's lead. Well, Google announced recently that they have had to relax their hiring standards. They haven't been able to get enough "absolute best" people and it is slowing down growth of the firm.

In Northeast Indiana, QPU found that our firms are also dealing with the trend. Based on the Placement opportunities featured on the ASQ Section 0905 website, the selectivity seems to have decreased when a recruiter is used.

	Average number of constraints per hire	
	Company-placed	Agency-placed
2005	20.8	36.5
2006	19.5	17.6



TACTICS

Design of Experiments for Assembled Products

Last month QPU cited a *Manufacturing Engineering* article which convincingly showed that measuring every seemingly key dimension on every component does not necessarily make the highest customer satisfaction in the finished assembly.

This month we look at some of the state-of-the-art methods for designing robust processes for such cases. Quality improvements experiments in industry typically use fractional factorial, Taguchi designs, or response surface methods to investigate effects of factors on the

performance of a product. These designs can not be used if the product or process limit the combinations of factors for some practical reason. For example, an experimenter can not control the properties of wood or leather. Likewise, it may be impossible to control minor impurities in some chemicals like dyestuffs. One further example is when products are assembled from several components. It may be prohibitively costly to fabricate some of the unique components desired by traditional experimental designs. Likewise the components may not be reusable. Another third issue is that some of the key characteristics may not be directly measurable. Two examples are hydraulic gear pumps and electro-acoustical transducers.

In a pump, hydraulic fluid is drawn through by rotating gears. The efficiency of the pump decreases as fluid seeps from around the internal components. Three leakage sites were identified, but could not be measured directly. Classical fractional factorial methods were insufficient because the gear teeth could not be machined accurately enough within acceptable costs. Further, the components could not be reused because of wear occurring during the experiments.

In the transducer, two factors identified: the magnetic permeability of the armature and of the yoke could not be explored because there was no means to produce these components with the exact magnetic permeabilities required because they varied with position in the kiln and batch formulation.

In the *Journal of Quality Technology* five authors describe methods to overcome these issues. One of the authors, Dr. Susan Lewis of the University of Southampton in the UK provided us with significant amounts of detail regarding these experiments. We appreciate her willingness to share her explanations.

The authors suggest that there are at least three different experimental design methods with which to approach this: (1) CAD simulations, (2) an exchange algorithm experimental design, and/or (3) a genetic algorithm experimental design. Exchange and genetic algorithms are classes of experimental designs called D-optimal. Almost all algorithms for constructing D-optimal designs that base on the idea of sequentially exchanging "bad" candidates of a design for "better" ones. These designs try to maximize a mathematical matrix determinant (remember your high school linear algebra..if not, don't worry there is free software on the internet to solve these easily. It really is as easy solving response surface optimizations in Minitab.)

D-optimal designs are great when measuring is expensive. They also provide practical designs when there is more than optimality criterion. That is when the accountants want to optimize cost, and the reliability engineers want to optimize duty cycle.

Dr. Lewis told us that while she has not conducted a CAD simulation, she understands through the grapevine that some attempts were made several years ago, but without success. In 2005, Dr Liu made a simulation experiment using a complex numerical analysis technique called a moving boundary problem as reported in Chinese Hydraulics and Pneumatics. That's way beyond most of our experimental design needs or available time.

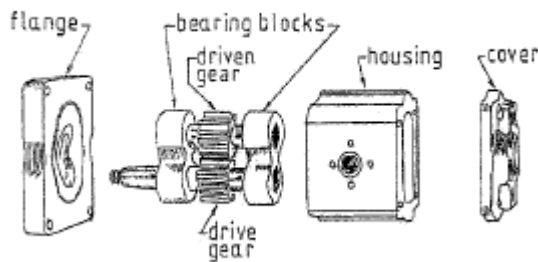
The exchange algorithm differs from 'normal' experimental designs because it can find designs when the factors or the combination of factors can only be selected from the available samples of components, which can only be used once.

The genetic algorithm represents a class of global optimization methods based on survival of the fittest and natural selection. There are two types of genetic algorithms: crossover and mutation.

A **Crossover design** is conducted with two experimental condition sets A and B, where A is a feasible collection of the values of eight factors: for example: ++++---+. B is another set: --+++-. The crossover comes when random chunks of the factors 1-4 at level A are combined with factors 5-8 of level B: ++++---+. Cast out the combination A, B, or 1-4A/5-8B1-4A/5-8B with the worst response. In this example, A is worst. The fourth experiment then becomes one that mashes up B and 1-4A/5-8B. The new experimental point is 1B/2-4A/5-8B: -+++++. Again, find the point with the worst response. Throw it out, and mash up the remaining two.

A **Mutation design** is one where the values of the factors only at selected areas are changed frequently. Start with A again. Create A2: ++++---+ and A3 ++++---+. Determine which gives the worst response. Again it was A. Create A4: ++++---+.

In the actual designed experiments, Dr Lewis and her colleagues identified nine factors influencing the leakage flow around the pump.



Factor	Type	Experimental Values		
Flange offset	Controllable	-0.25	0	0.25
Cover offset	Controllable	-0.25	0	0.25
End float	Controllable	0.1	0.2	0.3
Bearing size	Uncontrolled	0-49		
Involute form	Uncontrolled	0.05-0.090		
Lead edge error	Uncontrolled	11.08-19.58		
Side gap	Uncontrolled	2.38-20.0		
Pressure	Controlled	50	80	100
Speed	Controlled	1000	1800	2600

Each of the 44 prototype pumps was tested at nine configurations of pressure and speed. The pump tests were not randomized because of the difficulty mounting the pump.

The data analyses are too involved for this newsletter but involve common ANOVA methods and Q-Q plots of expected versus actual data distributions. In this case, setting the end float position almost halved the mean leakage at extreme pressures, but not extreme speed. This was consistent with simple hydraulic engineering thinking. Surprising was the extreme leakage when the flange and cover were at the "0" positions. This required further thinking about engineering behavior of the balanced floating bearings with these pump designs.

Dr. Lewis and her colleagues reported in the *JQT* article that there were unable to find any particular advantage to the exchange algorithm or the genetic algorithm. she notes that efficient use of the genetic algorithms requires careful identification of the factors and their values. Ironically, some of that selection process may involve pre-experiments using fractional factorial designs. She concluded that the genetic algorithms converged to an answer more quickly than did the exchange algorithms. This was especially true as the complexity of the problem increased.

Dr. Lewis has made the Design of Assembled Products software available for free download at http://www.maths.soton.ac.uk/~sml/screen_assemble.



I'm just starting my project. How do I get to these factors?

Dr. Lewis and her colleagues in a soon to be published paper that she forwarded to us, talks about a **two-stage screening method**. After brainstorming factors, the factors are grouped. All of the factors in a group are varied simultaneously. The analyses are done using standard DOE and statistics. Highly active factors in each group are then studied individually in a second round of screening. This two-stage group screening is effective in catching interactions. Interactions show up frequently in chemical/pharmaceutical studies and chem engineering scale-ups where wall effects diminish.

Trends in industry are often telegraphed into candidate requirements in job postings and they can serve as a window into the latest corporate initiatives. As trends go, none has been more contested and anticipated than the evolving relationship between Six Sigma and Lean. Today there are increasing signs found in job postings that these two corporate initiatives are headed down the aisle of eternal matrimony.

Based on a recent study of over 3,000 internet job board postings, The Avery Point Group found that Six Sigma still outpaces Lean by a wide margin when it comes to desired skill sets. However, for those companies seeking Six Sigma talent, fully one-third are looking for practitioners to also have Lean expertise as part of their tool set. For companies seeking Lean talent the desire is even greater for candidates to also possess Six Sigma knowledge, with almost half of all Lean jobs posted requiring Six Sigma exposure. The merger between Six Sigma and Lean is also clearly evident for jobs posted at the very heart of Six Sigma's key leadership roles. Almost half of all companies seeking to specifically hire Master Black Belt and Black Belt talent required candidates to also possess Lean as a core part of their tool set.

When it comes to Six Sigma and Lean skill sets, it is becoming increasingly obvious that companies want to have their cake and eat it too. Furthermore, the study found that even though companies may not have a full-blown Six Sigma or Lean deployment underway, they highly desire talent that possesses both Six Sigma and Lean skills to be part of a candidate's DNA. Continuous improvement practitioners on either side of the aisle might want to sit up and take notice that this wedding is clearly underway.

For further evidence of this tryst, one only need look to published books. Six years ago books published on the combined topic of Lean and Six Sigma were virtually nonexistent. Today, however, they dominate the continuous improvement publishing landscape. Over the past two years alone, books published on the combined topic of Lean and Six Sigma represented almost half of the Lean books published and a quarter of the Six Sigma books published.

For some purists, this mixed marriage is viewed only with contempt; for others it is seen as a natural progression - the result of companies seeking to blend the best of both methodologies in order to remain competitive in today's global economy. Those that perpetuate the divide between Six Sigma and Lean are clearly missing the point. Core to both methodologies is the idea that challenges need to be approached with an open mind, because solutions can sometimes come from the most unlikely of sources. True Six Sigma and Lean practitioners will view this marriage with an open mind and realize that these are truly complementary tool sets, not competing philosophies.

About the Author:

Tim Noble is an executive recruiter and managing principal of The Avery Point Group, a leading national executive search firm providing functional expertise and executive search focus in the areas of Six Sigma, Lean, plant management, operations management, supply chain management and finance. www.AveryPointGroup.com Author's Blog: <http://lean-sigma-insights.blogspot.com/>

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