



Summer 2011 Vol. 30 No. 3

PARAMETRIC WORLD

A Periodical of The International Society of Parametric Analysts



Mike Mullen — Keynote Speaker (Photo by Rob Currie)



Society award winners — Druley, Stukes, Smoker (Photo by Henry Apgar)



Affordability Initiatives Panel — Ricci, Noteboom, Barbic, Thomas, Bagby, Burke, Harwin (Photo by Rob Currie)

INSIDE THIS ISSUE

Letter From Your Editor	2
Chairman's Address	3
The Initiative for a New Society	4
Calendar of Events	5

ISPA/SCEA Joint Conference Retrospective	6
2012 Conferences.....	12
European Perspectives	16
Society Activities	18

Chapter News	19
Officer Reports	20
Ask A Parametrician.....	23
Best Paper, Models & Methods Track	25

PARAMETRIC WORLD

ISSN 1072-3803

Editor

Charles Hopkins
Email: charlesvhopkins9@aol.com
408-252-8690

Chair, Board of Directors

Andy Prince 256-682-6456
andy.prince@nasa.gov

Deputy Chair

Greg Kiviat 203-386-7274
gkiviat@sikorsky.com

Secretary

Lisa Yedo 303-939-5881
lyedo@ball.com

Treasurer

Bruce Minett 714-896-5080
freewayflier@earthlink.net

Executive Manager

Rich Harwin 562-797-3869
richard.a.harwin@boeing.com

Directors

Kurt Brunner 310-536-0011 x144
kbrunner@tecolote.com

Madeline Ellis 818-888-8216
madelineellis@socal.rr.com

Brian Glauser 818-888-8216
BGlauser@galorath.com

Hervé Joumier 31-71-565-3227
Hervé.Joumier@esa.int

Steve Sterk 661-276-2377
steve.a.sterk@nasa.gov

George Stratton 520-545-6031
gstratton@raytheon.com

Parametric World Chair

Madeline Ellis 818-888-8216
madelineellis@socal.rr.com

ISPA/SCEA Joint International Office

527 Maple Avenue East, Suite 301
Vienna, VA 22180
Phone: (703) 938-5090
Fax: (703) 938-5091
Web: www.ispa-cost.org

PARAMETRIC WORLD, published by ISPA, is copyrighted in its entirety. Send editorial material to Charles Hopkins, Editor. Email: charlesvhopkins9@aol.com

ADVERTISING RATES

Ad Size	Rate per Issue*
Full page	\$450
1/2 page	\$275
1/4 page	\$175

*Members in good standing receive a 15% discount. Contact Madeline Ellis for details.

LETTER FROM YOUR EDITOR

IN THIS ISSUE



This issue features a retrospective of the Joint ISPA SCEA Conference successfully concluded in Albuquerque. Note that we have chosen to include a summary of one of our Best Papers (from Models and Methods Track) as part of the documentation of the Conference.

We also look ahead to the 2012 International conference in Belgium; the membership of ISPA considers the Society's international conferences as basic to our charter. To allow adequate response time, we are issuing an Announcement/Call for Papers for the ISPA/SCEA International Conference 2012 in this issue. Note also that there will be **two** sanctioned conferences next year: the International Conference in Brussels and SCEA/ ISPA Annual Conference in Orlando.

Especially newsworthy in this issue is potential creation of a **new** society from the merger of ISPA and SCEA. We present the views of key Society leaders on this issue. *Parametric World* stands ready to publish key documents to inform the membership on this seminal issue.

There is a new department in this issue that I have chosen to call **The State of Our Art**. This department will include Joe Hamaker's **Ask a Parametrician** feature plus current papers that illustrate novel parametric modeling work. This time we have a prize- winning paper by Doug Howarth: **Trade Space, Product Optimization and Parametric Analysis**. This application uses econometric techniques and pricing analysis in an aerospace environment.

We are deferring, by one issue, our ongoing tribute to Peter Korda. We have fresh material including an appreciation of his teaching methods and some of his sayings about how parametric cost analysis should be used in the real world. At publication time we learned that Mr. F. Kelly Chamberlain, a pioneer in our field, has died. We will add him to those we honor in the next issue.

Charles Hopkins

Editor, *Parametric World*
charlesvhopkins9@aol.com

BY ANDY PRINCE



A great conference and a huge announcement! Once again ISPA and SCEA teamed up to put on an excellent conference. We had over 500 paid attendees and set a record with the number of papers presented.

Our keynote speaker was outstanding and the DoD Affordability Initiatives Panel provided valuable insights from government and industry leaders.

The amount of work that goes into organizing, planning, and executing a conference is tremendous. When a conference is as successful and runs as smoothly as our Albuquerque Conference, you know that the people in charge and involved did their jobs, and did them well. I want to thank Rich Harwin and Mel Etheridge for their outstanding work as conference co-chairs. Sherry Stukes and Paul Marston deserve thanks and praise for the incredible job they did as program chairs. Once again, we had an excellent training program thanks to the efforts of Roy Smoker, Peter Braxton, and Kevin Cincotta. A big thank you to Debra Lehman for serving as the Best Paper Awards chair. Another big thanks to you, Joe Hamaker, for once again being the ISPA Society Awards chair. We could not do these conferences without the support we get from the Joint Office, so thank you, Erin Whittaker, Erica Wilkening, and Joe Wagner for handling registration, logistics, publishing, and the 101 other details necessary to make the conference successful. Finally, to all you track chairs, thanks for an outstanding job in managing your authors and in running the paper sessions.

Now, let me turn my attention to the announcement of a merger between ISPA and SCEA. Both the ISPA Board and the SCEA Board have agreed to pursue a merger of the two societies. Both boards have agreed to a framework and a timeline. We are in the process of establishing an integration team, under the leadership of Jason Dechoretz, to work out the details and lead us through the process. There are articles in this issue that explain how and why, so I am not going to do that here. However, I do want to make sure everyone is clearly informed concerning a few key points.

Our number one focus is on what provides the best value for the members and what strengthens the field of parametric cost estimating.

This decision, which was unanimously approved by the Board of Directors, was made only after careful consideration and deliberation. We discussed alternatives and developed a strategic approach. One of our key tenets is that this be a merger of equals. In this, SCEA has agreed.

Communications is vital to this process. To that end, the Board is making changes to the ISPA website and establishing a Facebook page to share information and facilitate discussion. I am willing to talk to anyone and everyone. You can find my contact information inside the front cover.

Finally, you, the membership, get the final say. Nothing happens without approval of the members. Until the membership approves, this is all just planning.

One other important event happened at the conference. We elected three new ISPA Board members (Rich Harwin and Steve Sterk got re-elected): Brian Glauser, Hervé Joumier, and Lisa Yedo. Welcome to our new board members! They have already gotten busy with Society duties: Lisa was elected secretary; Brian agreed to lead website improvements and be the elections committee chair; and Hervé is helping with the 2012 conference in Brussels, Belgium.

Speaking of the 2012 Conference, Jason is off and running as conference chair, ably assisted by experienced conference hands Sherry Stukes, Hank Apgar, and Hervé Joumier. On the ground in Brussels René Berghuijs and Natalie Faucher are busy handling hotel arrangements and other logistics. This is shaping up to be one of our best international conferences ever, so plan on being there May 14th, 15th and 16th. To further enhance your professional experience, SSCAG and EACE are meeting at the conference hotel on the 17th and 18th. I am excited about Brussels in 2012 and I hope you are too. Till next time.

Andy Prince

ISPA CHAIRMAN OF THE BOARD

256-682-6456

andy.prince@nasa.gov

THE INITIATIVE FOR A NEW SOCIETY

By JASON DESCHORETZ

Why a Merger?



Let me start out by saying that I never thought that I would find myself writing an article explaining why we are pursuing a merger with SCEA. I joined ISPA because I believe in and support its mission to promote parametric cost estimating. I also joined because, in my

opinion, it is where the best and brightest come together to learn from and challenge each other in professional growth. Finally, I joined because I saw a culture that encourages camaraderie and celebration of our accomplishments — two very important morale-building activities for those of us who are often the bearers of bad news and the targets of management ire.

My opinions about ISPA have only been reinforced by my leadership experiences. However, leadership requires that we, the ISPA Board of Directors, take the big picture view and consider what is best for our members and for the promotion of our profession. When we take this 'big picture' view and look at what is happening in the professional community, government, and industry the data leads us to the conclusion that a merger is in our best interest.

First of all, from an operations standpoint, many of our functions are already integrated. We have a joint business office, a joint professional journal, an integrated training program, and conduct an annual joint conference. In every case where we have undertaken a joint activity with SCEA, the overwhelming response from the members has been positive. We have received excellent support from the joint business office. The quality of our conferences has improved, with increasing numbers of attendees and papers. The joint journal has also been a success and the two societies have been able to enter into an agreement with a professional publisher to expand the reach of the journal and increase the number of annual issues. A merger will eliminate the inefficient duplication of any remaining standalone activities, increasing value while reducing cost.

In the area of training and certification, we have found that our existing products are complementary. SCEA has agreed that the new society will continue to advocate for and educate professionals in parametric analysis. Continued advocacy for parametric cost analysis is important to ISPA and was a requirement for continued merger discussions. However, when we look at trends in government and industry, we see a movement away from the specialized parametric analyst. This is not to say that parametrics are less important; in fact, I believe that they are more important

today that they were 30 years ago. Rather, what we see today is an expectation that a cost estimator will have a broad range of skills and abilities that includes parametrics, but also includes EVM, schedule analysis, grass roots estimating, systems engineering, etc. The specialist of the future will need to have a broad range cost estimating and analysis knowledge and skills, and that kind of specialist is better served by a professional society that can address multiple disciplines.

You, the members, have told us that you want more joint activities. The membership survey performed in 2010 indicated that single dues with membership in both societies, along with an expanded joint training program and establishing a joint website were the most valuable actions we could take. This is based on the responses of the people who identified themselves as ISPA members only! (Single dues and expanding the joint training program were also identified as important to respondents who are members of both societies.) Another interesting fact from the survey is that 58% of the respondents who identified themselves as ISPA members are also members of SCEA. Since 42% of the ISPA membership responded to the survey, I think it is fair to say that most ISPA members are already SCEA members, which indicates that many of us derive value from both societies.

In summary, let me reiterate that the decision process that has led us to this point has been serious and deliberate. The Board of Directors listened to what the members were telling us, we discussed industry trends, we created and examined alternative strategies for the future, and, once we decided that a merger was in the best interest of the Society, we outlined the conditions under which we were willing to enter into merger talks with SCEA. Prior to the 2011 Joint Conference, both Boards agreed to a framework for merger and we are establishing an integration team to define the details. The actual merger cannot take place until the membership of ISPA agrees. Up until that time, it is just talk and planning. Please make every effort to stay informed, and if you are not getting the information you need, please call me or send an email. My contact information is in the inside front cover of this publication.

The Road Ahead

With most things in our line of business we would rather start with an existing product (e.g., spreadsheet, briefing to management, a model, etc.) and then customize it for our immediate need than start from scratch! When it comes creating a professional society that addresses the needs of the cost analysis profession

I think the same will hold true. If you were at the 2011 International Conference in Albuquerque and especially at the ISPA Members meeting on 8 June, you are well aware that the Boards of Directors of ISPA and SCEA have agreed to integrate the two societies into one new organization. In his article our Chairman, Andy Prince, eloquently outlines the motivation behind the Boards' decision. The goal is to take the best of both Societies products and culture, add in some new items to reflect the expected needs of the membership and broader community, and create a NEW SOCIETY.

Now I'd like to share with you the road map and timeline on how we expect to achieve this feat. Bill Haseltine (now SCEA's past President) and I created a framework for how the two societies could integrate. In addition, we established some very specific goals and outlined some basic ground rules. These were briefed to the respective Board of Directors, unanimously approved by them and shared at the respective Members' meeting. We have since drafted an integration plan that will be formally signed by the ISPA Chairman (Andy Prince) and SCEA President (Paul Marston). This plan sets the goal of accomplishing the integration effort by **1 January 2012**; however, we want to do this right (meaning adhering to both Societies' by-laws and making informed decisions) so the timeline may slip some.

To guide the efforts leading up to this milestone we have created a Society Integration Committee which is co-chaired by Andy and Paul. They will have Neil Albert and Hank Apgar available as specific advisors to them.

All decisions about what to take from both Societies and what to add to create the NEW Society will vetted and decided by this committee. Their recommendations will be

briefed at the Fall 2011 meetings of both Societies' Boards. The decisions by the Boards will then be communicated to the respective memberships. In the case of ISPA there will be formal, written notifications and a call for a vote to adopt the Board's decision. While we have agreed to a robust framework that defines the concept objectives and mechanics of the NEW Society, there are still some details to be worked out. These will be accomplished by solution teams, which will address the following specific topics and are expected to be staffed by the following leaders:

Solution Teams	SCEA	ISPA
Governance:	Bill Haseltine	Jason Dechoretz
Naming:	TBD	Greg Kiviat
Financial:	Debra Lehman	Greg Kiviat
Training & Body of Knowledge:	Dan Nussbaum	Tom Coonce
Publications:	Joe Wagner	Sherry Stukes
Certifications:	Bill Haseltine	Roy Smoker
Awards:	Carol Hibbard	Hank Apgar

These solution teams will be supported by a variety of Subject Matter experts so that they can not only discuss the remaining issues but provide specific recommendations to the Integration Committee and eventually to the two Boards of Directors. Please contact the ISPA Solution Team Lead if you want to contribute to the recommendation! Otherwise, please stay tuned; there will be more information posted on the ISPA Website (including a Blog to collect the thoughts of Members), sent via e-mail updates and in *PW*.

CALENDAR OF EVENTS

August 16 – 18, 2011

FY 2011 NASA Cost Symposium
Gilruth Center, Johnson Space
Center, Houston, TX
www.nasacostsymposium.info

September 13, 2011

Joint ISPA/SCEA So. Cal Workshop
University of Southern California,
Los Angeles, CA
USC registration: Ms. Julie Sanchez
jasanche@usc.edu or (213) 740-5703

September 20, 2011

Society for Cost Analysis &
Forecasting (SCAF) Annual
Conference, Royal Institution for
Naval Architects, London

September 21 – 22, 2011

Space Systems Cost Analysis Group
(SSCAG), Wyle Corp, Chantilly, VA.
David Pine: dpine2@cox.net

December 14, 2012

Joint ISPA/SCEA So. Cal Workshop
Fort Mac Arthur, San Pedro, CA
Contact: Quentin Redman
310-692-5926

May 14 – 17, 2012

2012 ISPA/SCEA Joint International
Conference & Training Workshop
Sheraton Brussels Hotel
Brussels, Belgium

May 17 – 18, 2012

SSCAG (with European Aerospace
Working Group for Cost Engineering)
Sheraton Brussels Hotel
Brussels, Belgium

June 26 – 29, 2012

2012 SCEA/ISPA Joint Annual
Conference & Training Workshop
Hilton Orlando Hotel, Orlando, FL

In The Land of Enchantment!

By RICH HARWIN, CONFERENCE CO-CHAIR

ISPA and SCEA's Joint Conference was held from June 6–10 and concluded with the certification exams on June 11. Our location was the Hyatt Regency in downtown Albuquerque. We had eight walk-ins bringing our final paying attendance to 507, which was the second highest attendance ever.

This year we had nineteen Exhibitors: **ACEIT — Automated Cost Estimating Integrated Tools, Acumen, The Boeing Company, Booz Allen Hamilton, Cobec Consulting, Inc., Dekker Ltd., Frontier Technology, Inc., Kalman & Company Inc., MCR LLC, National Contract Management Association (NCMA), Palisade Corp., PRICE Systems, Pro-Pricer, Scitor Corp., SEER by Galorath, TASC Inc., Technomics, Inc., Tecolote Research Inc., and Wyle.** We sincerely thank them for their support and participation.

Four of our exhibitors offered 'Exhibitor Sessions' to the conference attendees on Tuesday which facilitated lengthier presentations of products and services in a classroom environment without the distractions and interruptions which often occur at exhibitors' booths. These sessions were not part of the training and technical presentations and the rooms were crowded. We also wish to thank our eight corporate sponsors for their generous support: **ACEIT, Booz Allen Hamilton, Kalman & Company Inc., Lockheed Martin, MCR LLC, Northrop Grumman, PRICE Systems, SEER by Galorath, and Technomics, Inc.**

The Keynote speaker on Wednesday was **Mike Mullane**, a former Shuttle Astronaut and veteran of three space flights. His presentation was both enlightening and entertaining, relating the lessons of his life and time with NASA to the need for good open and honest communications.

We had a Government/Industry panel on Thursday with the theme of *'DoD Affordability Initiatives related to Should Cost/ Will Cost'* presented by our knowledgeable guest speakers: **Dr Richard Burke**, Deputy Director of Cost Assessment, OSD CAPE; **Steve Bagby**, Deputy Assist Sec of the Army (Cost & Economics); **George Barbic**, Director of Estimating, Program Assessment, Lockheed Martin Corp; **Dan Noteboom**, Director of Estimating & Pricing, Boeing Defense Systems; **David Ricci**, Director of Estimating and Program Control, Northrop Grumman

Corp.; and **Duncan Thomas**, Technical Director for the Naval Center for Cost Analysis.

A conference reception was held on Tuesday at the hotel, where attendees mingled with colleagues and leisurely listened to (though some participated with) local musicians and entertainers. On Wednesday we provided transportation to Old Town Albuquerque to enjoy some of the local culture. And our annual Societies banquet was Thursday where awards were presented for best papers and societies' awards. Over the week the Hyatt chef prepared many Southwest styled dishes for us.

There were many, many people who gave generously of their time at the conference to make it a success. I can only mention a few here: **Paul Marston** (SCEA) and **Sherry Stukes** (ISPA) were the program co-chairs and handled the difficult job of scheduling the workshop presentations and making everything 'fit'; **Peter Braxton** and **Kevin Cincotta** (SCEA) and **Dr. Roy Smoker** (ISPA) did an excellent job on joint training; and Debra Lehman lead the Best Paper selection committee and process. I would especially like to thank my partner and SCEA Co-Chair, **Mel Etheridge**.

Plans are already underway for next year's overseas conference to be held in Brussels, Belgium so mark your calendars for May 14-17 with training extended to May 18, 2012.



Henry Apgar

Conference 2011 Workshop Program

By SHERRY STUKES AND PAUL MARSTON, PHOTO BY ROB CURRIE

The 2011 Joint Annual Conference and Training Workshop included 95 outstanding technical workshop presentations that were selected from over 160 abstracts initially submitted for consideration. The selection process was very difficult due to the high quality of the abstracts.

The 95 presentations were organized into six tracks and were presented over the three-day conference. The tracks included:

- Applications
- Management
- Models and Methods
- Research
- Risk
- Software

The remaining abstracts not selected for presentation were put on a prioritized wait list and were given presentation slots as they became available. Authors on the wait list were able to submit papers and presentations on an e-track that allowed them to be eligible for a Best Paper award while they awaited a presentation slot.

This workshop program turned out to be unique this year in that every presentation scheduled was presented as shown in the schedule. There were no replaced presentations or empty slots in the program! Copies

of the papers, presentations, speaker biographies, and abstracts, were provided to all attendees on a CD.

The Workshop Co-Chairs, **Sherry Stukes** and **Paul Marston**, could not have coordinated all of these presentations without the support of an enthusiastic group of sixteen track chairs. The outstanding track chairs include:

Track	Track Chairs
Applications	Doug Howarth, Bob Hunt, Jim Roberts
Management	Kurt Brunner, Rey Carpio, Mike Ross, Frank Flett
Models and Methods	Hank Apgar, Leigh Rosenberg, Quentin Redman
Research	Tom Sanders, Cari Pullen
Risk	Tim Anderson, Andrew Drennon
Software	Joe Dean, Leone Young

The track chairs spent countless hours coordinating pre-conference activities for their track and the presenters. At the conference, the track chairs introduced the speakers, ensured that the tracks ran smoothly on schedule, and managed the audience questions.



Track Chair Awards

Conference 2011 Best Paper Awards

BY QUENTIN REDMAN, PHOTOS BY ROB CURRIE



The 2011 conference workshop papers were reviewed by the paper awards committee members to determine the best paper in each of the six presentation tracks and the non-presented e-Track. Once the winner of each track was selected, an overall 'Best of Conference' Paper was selected.

The paper judging was performed against four criteria: Technical content, Creativity, Professional application to our profession, and Overall quality or style.

To determine the 'Best in Track Paper' for each track, two judges were assigned to each track and independently judged each paper in that track on a scale of 1-5 in four categories listed above. This resulted in a weighted score for each paper from each judge. The two scores were averaged and the high score within the track won best paper for that track. In case of a tie, a third judge 'judges' the tied papers and their score determines the winner. Once the Best in Track Papers were determined, the 'Best of Conference Paper' was selected. This was done by having each judge score each of the winners in the other tracks, and the scores for each of the papers from the entire team were averaged.

The 2011 Best Paper winners were:

Track	Paper	Author(s)
Best of Conference	Covered with Oil: Incorporating Realism in Cost Risk Analysis	Christian Smart
Applications	A Methodology for Multivariate Regression on Large Datasets	Matthew Pitlyk
Management	Instrument Schedule Delays Potential Impact on Mission Development Cost of Recent NASA Projects	Kristina Kipp, Stephen Ringler, Erin Chapman, Luke Rinard, and Claude Freaner
Models and Methods	Trade Space, Product Optimization and Parametric Analysis	Doug Howarth
Research	Joint Cost Schedule Model (JCSM) — Recent AFCAA Efforts to Assess Integrated Cost and Schedule Analysis	Antonio Rippe, Greg Hogan, Darren Elliott
Risk	Covered with Oil: Incorporating Realism in Cost Risk Analysis	Christian Smart
Software	Software Cost Estimation Using an Decision Graph Process: A Knowledge Engineering Approach	Sherry Stukes, John Spagnuolo Jr.
e-Track	An Improved Method for Predicting Software Code Growth: Tecolote DSLOC Estimate Growth Model	Mike Ross

Continued on page 11.



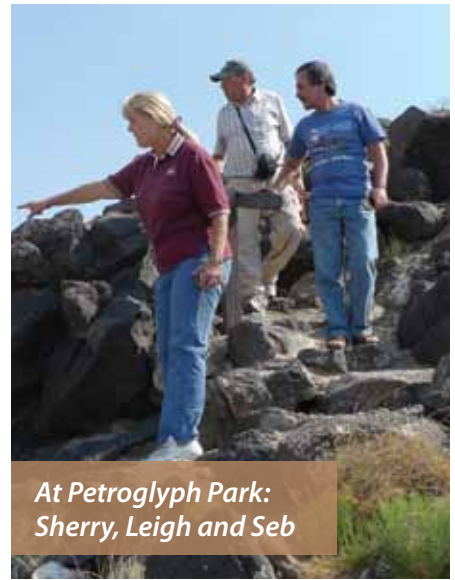
Award winners Claude Freaner, Sherry Stukes, Doug Howarth, Dr. Christian Smart, Mike Ross, and Matthew Pitlyk.

ISPA/SCEA JOINT CONFERENCE RETROSPECTIVE



Conference Co-Chairs, Rich and Mel

Rob Currie



At Petroglyph Park:
Sherry, Leigh and Seb

Henry Apgar



Dining in Old Town

Henry Apgar



Best Paper Author Dr. Smart

Rob Currie



Sikorsky Team: Joanne Wang, Greg Kiviat, Seb Botta

Rob Currie



Erin Whittaker, Conference Planner

Rob Currie

ISPA 2011 Professional Awards

BY JOSEPH W. HAMAKER, PhD, CPP

Each year ISPA solicits nominations from the membership for the three Society professional awards which are:

The **Keith Burbridge Service Award** is presented to a Society Member or participating group who has provided substantial volunteer service to ISPA in a manner supporting the principles and goals of the Society. This award was renamed in 1996 to honor Keith Burbridge, an ISPA Founder. The recipient(s) must be ISPA members. Repeat awards are allowed.

The **Clyde Perry Parametrician of the Year Award** is presented to an individual or group who has made outstanding contributions to the profession of parametric cost analysis during prior years, but for a minimum of two years. This award typifies a leader in the activities of practicing or promoting the use of parametrics. This award was renamed in 2004 to honor Clyde Perry, an ISPA Founder. The recipient need not be an ISPA member. The recipient may qualify for this award only once in a lifetime.

The **Frank Freiman Award** is our highest honor and is presented to an individual who has made outstanding contributions to the theoretical or applied aspects of parametric modeling or cost estimating. The individual should have promoted or applied parametric methods over a significant amount of time. A Freiman candidate is expected to have left a legacy to the profession for at least five years and can receive the award only once in a lifetime. This award was named to honor Frank Freiman for his pioneering work in the development of parametric models and for his role in the founding of the Society. The recipient need not be an ISPA member. The recipient may qualify for this award only once in a lifetime.

I led the selection committee this year, which, as always, was composed of former winners of one or more of the above awards. This year we had twelve committee members and we received a number of nominations for each of the three awards (the award process having been opening and advertised in *Parametric World* earlier this year). The committee does not necessarily select a winner for each award if the nomination material is not compelling—many years we have not awarded all

three awards. This year, however, we did have excellent nominations for all three awards so all three awards were presented at the Joint ISPA/SCEA Annual Conference in Albuquerque during the conference banquet. I am happy to inform you that the 2011 ISPA professional awards went to the following very deserving candidates.

The Keith Burbridge Service Award went to **Doug Druley** of BAE Systems. Mr. Druley has served on the ISPA Board of Directors for several terms and co-chaired the 2010 ISPA/SCEA Conference. In addition, in 2002 at the request of the Board of Directors, Mr. Druley initiated, organized and coordinated the ISPA Certified Parametric Practitioner program. He has continued to coordinate the training sessions and certification program including the examination every year since then.



Doug Druley Receiving The 2011 ISPA Service Award from ISPA Chair Jason Dechoretz

The Clyde Perry Parametrician of the Year Award went to **Dr. Roy Smoker** of MCR. Dr. Smoker has a long history of research contributions to the field of parametric estimating. He has made major research achievements in space launch vehicle data analysis, model development and estimating. He has performed parametric estimating of schedule, cost and schedule risk issues based on earned value data and the derivation of estimating relationship forms from the fundamental theory of econometrics. Dr. Smoker's innovative work on cost and schedule estimating based on Technology



Roy Smoker Receiving The 2011 ISPA Parametrician of the Year Award from ISPA Chair Jason Dechoretz

Readiness Levels was the first truly data-based study of TRLs vs. cost and schedule; his work has served as the starting point for all additional research in the subject.

The Frank Freiman Award went to **Sherry Stukes** of NASA JPL. Since 1980 Ms. Stukes has made outstanding contributions to the applied aspects of parametric modeling; these include parametric cost estimating and the application and promotion of parametrics. Ms. Stukes is probably best known for her innovation in the development of comprehensive software databases and innovative software models; these models remain the gold standard of space-system costing data bases and

are the basis for all other software costing data bases. Another distinct area of software costing to which Ms. Stukes has made important contributions over the past two decades is software sizing. She has written and spoken often on various aspects of working with parametric estimating models, both in-house agency models and generally available commercial or academic models. Her technical expertise provides a legacy to the profession spanning more than 30 years.

When you next encounter these individuals, please congratulate them on their distinguished achievement! And be please contemplating nominations for next year.



Sherry Stukes Receiving The 2011 ISPA Freiman Award from ISPA Chair Jason Dechoretz

Continued from page 8.

Committee members had a daunting task this year with so many high quality papers and presentations to review. We would like to thank the following reviewers for their time and dedication to this important task.

- | | | | |
|--------------------|-----------------|--------------------|-----------------------|
| • Jeffrey Jaenicke | • Lyle Davis | • Dale Shermon | • Barbara Stone-Towns |
| • Cynthia Foster | • Chris Dalton | • Joe Hamaker | • Steve Green |
| • Antonio Ortiz | • Kate Styers | • Doug Howarth | • Dawn Bozulich |
| • Stacy Dean | • George Culver | • Bob Hunt | • Dean Kimmel |
| • Douglas Brown | • Paolo Ponzie | • Guenever Aldrich | • Ken Marshall |
| • Eric Gabrielson | | | |

Why Two Conferences This Year?

BY HANK APGAR, HISTORIAN

I remember our 1987 board meeting in San Diego, when we were planning our upcoming 10th anniversary conference and wanted to offer something special to ISPA members. I think it was Seb Botta who suggested that, since we were an international society with 20% membership representation from outside the US, that we accept an offer of sponsorship from our UK chapter (now SCAF) to meet on the Southern coast of England. So, we settled on Brighton for our first international conference. Over 150 participants attended.

This outside-the-US conference every four years became our planning norm for the following 25 years. We enjoyed successful annual meetings at the following venues:

- 1988 Brighton, England, hosted by our UK chapter
- 1992 Munich, Germany, hosted by MBB
- 1996 Cannes, France, hosted by Aerospatiale
- 2000 Noordwijk, Netherlands, hosted by the European Space Agency
- 2004 Frascati, Italy, hosted by the Italian Space Agency
- 2008 Noordwijk, Netherlands, hosted by the European Space Agency

Even though we are committed to joint annual conferences and training workshops with SCEA, we continue to recognize our non-US members by offering an optional joint ISPA/SCEA conference and training workshop every four years outside the US. In 2012, we are holding our seventh international conference in Brussels.

In summary, 2012 will have two Joint ISPA/SCEA conferences: 1) The International Conference in Brussels and 2) a domestic conference in Orlando. Announcements follow.

Brussels Guest Program

BY DANIEL DEMEYERE AND KURT BRUNNER

We are planning an exciting and stimulating guest program for the spouses and significant others traveling to the conference. Brussels is an ancient city and is now the center of the European Union (E.U.). It has many museums, shops, the Cathedral of St. Michael and St. Gudula, the Grand Palace, and other attractions of great interest. There is plenty to hold a visitor's attention and fascination! Also nearby are the medieval city of Bruges and the Ardennes forest, which was the site of the Battle of the Bulge and is now home to the world famous Spa-Francorchamps racetrack. For those with a culinary bent there are world class eateries with delicacies such as the Mussels of Brussels, and immense cones of Pommes Frites (French Fries). Oh, and did we mention chocolate? More details will be available soon.



For some attendees, this was their first trip to Europe



Our Noordwijk conferences featured three days of guest program touring



Our Cannes meeting followed the Cannes Film Festival on the Riviera

Early Announcement

2012 ISPA/SCEA Joint International Conference & Training Workshop

Assuring Cost Efficiency: Global Solution

14-17 May 2012



Brussels, Belgium



Every four years, ISPA and SCEA present an annual conference in a non-US venue to accommodate our international membership and to provide a unique experience to meet with professionals and friends around the world. For 2012, we are pleased to announce our annual conference in **Brussels, Belgium**.

Consider the advantages to you:

- International networking opportunity with NATO mission and European Commission (EC) members
- Government and industry key-note speakers
- Subject matter experts on panels
- Nearly 100 workshop speakers—in several languages—offer hands-on opportunities in Parametrics, Risk Analysis, Earned Value Management, Whole Life Cost Analysis, and more
- Full training program to prepare for ISPA or SCEA certification
- Central European location; easy access via air and rail
- Traditional ISPA Receptions, Awards Banquet, and Guest Tour Program following the legacy of Brighton, Cannes, Munich, Frascati (as seen on right), and Noordwijk



At an affordable, all inclusive, cost:

- €130 room rate (breakfast included)
- Cheaper room rates (€80) before and after conference
- Airline shoulder season assures lower air cost
- Discounted registration rate for sponsor members
- Adjoining SSCAG/EACE meeting (17-18 May 2012)

Come to Brussels—heart of the Europe Union and home of NATO Headquarters. Enjoy the amenities of our international venue—the Sheraton Brussels. Enjoy the best international networking experience available — once every four years!

Additional Sponsors Include:



www.ispa-cost.org

Call for Papers

2012 ISPA/SCEA Joint International Conference & Training Workshop

Assuring Cost Efficiency: Global Solution

14-17 May 2012



Brussels, Belgium



Submit your abstract by 9 January 2012
Late submissions cannot be considered!

The Joint Conference Committee is seeking technical papers covering a wide variety of cost estimating and cost analysis topics including, but not limited to:

- Hardware/Software Estimating
- Cost Growth Analysis
- Whole Life Cost Analysis
- System of Systems Estimating
- Earned Value Management
- Risk Analysis
- Joint Confidence Levels
- Cost Estimating Models
- Cost Methodologies/Applications
- Decision Analysis
- Cost Benefit Analysis
- Benchmarking
- Cost As an Independent Variable
- Affordability Assessment

This is a great opportunity to demonstrate your expertise and contribute to the advancement of the profession. The schedule for this year's conference is as follows:

Abstract submission	9 January 2012	Instructions for uploading abstracts will be available at the ISPA web site, www.ispa-cost.org beginning in August 2011.
Author notification	31 January 2012	
Final submission	2 April 2012	

Note: For the two-day (17-18 May 2012) SSCAG/EACE meeting following the ISPA/SCEA conference, abstracts should be submitted directly to those sponsors.

If you have questions or need additional information about the workshops, please contact:

Sherry Stukes
sherry.a.stukes@jpl.nasa.gov
+1.818.393.7517



www.ispa-cost.org

Experience the magic of Orlando at the 2012 SCEA/ISPA Joint Annual Conference & Training Workshop

Hilton Orlando
26-29 June 2012



Come join us for a chance to learn and network in one of the greatest vacation destinations in the world — Orlando, Florida. We'll be at the Hilton Orlando on Destination Parkway, which is conveniently located near outlets, shops, and restaurants along International Drive. Transportation is available to local theme parks like SeaWorld, Universal Orlando, and Disney World. Why not stay over after the Conference ends and take advantage of this great vacation opportunity?

Learn

- Attend comprehensive training based on the Cost Estimating Body of Knowledge (CEBoK™) and the *Parametric Estimating Handbook*. Brush up on your skills, or prepare to take the CCEA exam, held Saturday, June 30.
- Professional papers will be presented in numerous tracks. Increase your marketability in a competitive employment environment by learning about best practices and the latest advancements in the field from industry experts.
- Keynote Speakers and panel discussions will provide insight and spark intriguing discussion.

Network

- Meet with vendors on our exhibit floor and learn about new tools and software in Exhibitor Sessions.
- Mingle with colleagues and exhibitors during day and evening events.

Bring the whole family!

The discounted hotel room rate of \$108 will be available for three nights before and three nights after the conference, so why not bring the whole family and enjoy everything Orlando has to offer? Nearby attractions include:

- | | | |
|-------------------------|-----------------------|--------------------------|
| • SeaWorld | • Walt Disney World | • Outlet Shopping |
| • Aquatica | • Animal Kingdom, | • Orlando Science Center |
| • Busch Gardens (Tampa) | Blizzard Beach, Magic | • Airboat Tours |
| • Universal Orlando | Kingdom, and more! | • Kennedy Space Center |

Stay tuned!

- Look for more information on the SCEA website (www.sceaonline.org) as it becomes available.
- Be on the lookout for the **Call for Papers**, scheduled to be sent out in August 2011.



EUROPEAN PERSPECTIVES

Notes from René Berghuijs — *Brussels, Belgium*



The 2012 conference will be held at the Sheraton Brussels hotel, which is located in the heart of the city close to all the major tourist attractions. The Sheraton was selected because of the conference facilities (all located on one floor), its location (walking distance to the Grand Place), and the big, comfortable hotel rooms. In addition, they offered outstanding hotel room rates and a cooperative contract. Next activities include the selection of the venue for the Awards Banquet, providing input for the information and registration website, and developing a social program.

Given the reputation of ISPA's International Conferences for the quality of papers, effectiveness of the training and participation by leaders in our community, we have a large number of European-based societies wanting to co-brand and support the 2012 conference. They include the Dutch Society for Cost Engineering (DACE), Society for Cost Analysis and Forecasting (SCAF), ISPA Deutschland, and the European Aerospace working group for Cost Engineering (EACE). They will be joined by our traditional partner the Society for Cost Estimating and Analysis (SCEA) and the Space Systems Cost Analysis Group (SSCAG). Please review the formal announcement (sent via e-mail and included in PW) and reserve the date!

The BeNeLux chapter will meet again in September. The topic of interest will be software cost estimation. The program isn't completely ready yet, but it will start with software requirements and sizing before going into effort estimation, commercial tools etc.

The meeting after that will be the combined ISPA / DACE meeting, on December first in Soest, The Netherlands.

All the best from Brussels!

René Berghuijs

NATO Air Command and Control System (ACCS) Management Agency

Notes from Arthur Griffiths — *The UK*

Optimism, Realism and Reality



Politicians are the champions of diversion. They all have the knack of changing the focus of attention from direct questions into areas that they would wish to illuminate. Government Departments, however, have a somewhat different role and, are now standing up to some challenging cost studies to support the mapping out of future policies and direction for their business areas.

Recent focus in the media has been on Health, Unemployment and Defence. Health has always been subjected to Private Finance Initiatives where funding is provided under private financial and commercial arrangements and monthly payments are made by the User (e.g. hospitals, etc.). The challenge here is to review the profit margins and commercial conditions to ensure that 'Value for Money' is still being achieved. In addressing unemployment the Government has introduced a 'Work Programme' where private companies take on the role of getting people back to work. This is on a payment by results basis with payments retained by the

Government until the person has been in single employment for a minimum of six months. Not sure how companies have estimated the expected volume of business and associated cost (as actual data is in very limited form) but it does mean that they will have to put up a lot of their own upfront cash.

The business flavour in the UK at the moment appears to be one of greater partnering for mutual gain. Let's share the costs, the risk and the investment in order to maximise opportunities. A good ethos but not without pitfalls for the cost estimator who must now consider more closely the additional effects of multi-site, multi-national implications.

Defence has been doing its own challenge. Improvements in policy and direction are rumbling on and this month (June). The MoD's (new) Major Projects Review Board, designated to scrutinise some of the Department's most expensive projects met for the first time. The Defence Secretary, Dr Liam Fox said that *"any project that the Board decides is failing will be publically named and shamed..... those responsible for poor*

Continued on page 22.

SCAF Annual Conference

**Theme: “Transforming and Improving Cost and Time Estimating
for the Next Decade”**

**Tuesday 20th September 2011
The Royal Institution for Naval Architects, London**

The Comprehensive Spending Review published in October 2010 set out how the Government would carry out Britain’s deficit reduction plan. There was an urgent priority to secure economic stability at a time of continuing uncertainty in the global economy and put Britain’s public services and welfare system on a sustainable long term footing.

The Spending Review made choices with particular focus to reducing costs and wasteful spending. As a result of these choices, departmental budgets have been cut by an average of 19 per cent over four years,

The ability to generate reliable cost and time estimates is a critical function necessary to support Defence expenditure. Without this ability, organisations are at risk of experiencing cost overruns, missed deadlines, and performance shortfalls - all recurring problems that project audit assessments too often reveal. Furthermore, cost increases and schedule delay often mean that the government cannot fund as many programmes as intended or deliver them when promised. This conference examines and discusses the steps currently being undertaken to improve the quality and confidence in the estimates being presented to senior officials. The conference speakers are at the forefront of this transformation process and will be discussing lessons learned as well as current cost estimating understanding. Our conference speakers include:

- **Neil Davies** – Chief Economics Advisor, Ministry of Defence
- **Dr Tim Sheldon** – Head of Cost Assurance & Analysis Service, Ministry of Defence
- **Dan Galorath** – Founder and Chief Executive Officer, Galorath Incorporated
- **Bob Barton** – Managing Director, NiteWorks
- **Hans Pung** – Vice President, RAND Europe and **Sarah Jilbert**, Independent Cost Consultant
- **Professor Trevor Taylor** – Royal United Services Institute for Defence and Security Studies
- **Mark Jones** – PhD Researcher, Airbus UK and Cranfield University
- **Paulo Ponzio** – Cost Engineering Group, European Space Agency

To register, please email: ndmorrell@dstl.gov.uk or call 023 9253 7271

2011 Elections for ISPA International Board of Directors

BY KURT BRUNNER, CHAIR 2011 ELECTIONS

The ballots have been cast, counted, and the results are in for the 2011 ISPA International Board of Directors election! The count, tabulated by the election committee, which consisted of Mostain Dara Billah, Joanne Fang, and Kurt Brunner, took place on June 8th at the Joint International ISPA/SCEA Annual Conference hosted by the Hyatt Regency Hotel. The outcome was announced the following evening at the Banquet. The newly elected Board members include Brian Glauser, Hervé Joumier and Lisa Yedo; Rich Harwin and Steve Sterk were reelected.

We congratulate the winners on their election and look forward to the dedicated service they will provide, and we sincerely thank all of the candidates for their participation. We especially express great appreciation and gratitude to the corporations and companies who employ or are associated with our board members. These institutions, through their generosity, make it possible for board members to travel and invest their time for the benefit of our society. Most importantly, we are grateful for you, the members, for participating in the election and making it a success.



Brian Glauser



Rich Harwin



Hervé Joumier



Steve Sterk



Lisa Yedo

SECRETARY'S REPORT

BY LISA YEDO, ISPA SECRETARY

More than five hundred people attended this year's ISPA/SCEA Conference and Workshop, which took place from June 7th to June 10th in Albuquerque, New Mexico. A few interesting attendance facts:

- There were 506 registered attendees, 13 guests, and 4 session-only speakers
- An estimated 38-40% of the attendees were first-timers
- 50% of attendees were SCEA members only, 10% were ISPA members only, 30% were members of both organizations, and 10% were not members of either organization (estimated based on survey results)

Outcomes of 2011 Board elections are reported earlier in this issue. In the New Board meeting on June 10th, specific positions were filled either through nominations or by request. Here is your first look at the new Board, along with roles and responsibilities:

- | | |
|--|---|
| • Andy Prince, Chair | • Lisa Yedo, Secretary |
| • Madeline Ellis, Chair — Parametric World | • Hervé Joumier, Board Member |
| • Greg Kiviat, Deputy Chair | • Rich Harwin, Executive Manager |
| • Brian Glauser — 2012 Elections Chair | • George Stratton, Board Member |
| • Bruce Minett, Treasurer | • Kurt Brunner, President, ISPA Southern California Chapter |
| • Steve Sterk, Membership Chair | |

As usual, there is a lot of work ahead for this Board but they also face some unique issues as the integration with SCEA begins.

ISPA Southern California Chapter News

BY KURT BRUNNER, PRESIDENT; QUENTIN REDMAN, VICE-PRESIDENT; SHERRY STUKES, SECRETARY/TREASURER

Don't miss our next joint **ISPA/SCEA Fall 2011 Workshop**. It will be hosted by the **University of Southern California (USC)** Los Angeles, CA, on **15 September 2011**. The agenda has been e-mailed to members and previous attendees, and it contains a location map and driving instructions. The agenda is also posted on the ISPA web site www.ispa-cost.org. This workshop will feature a definite software focus as well as briefings on other stimulating topics. There will be a 'Best Paper' presentation from the 2011 ISPA/SCEA Joint Annual Conference in Albuquerque, New Mexico as well as a training subject. The speakers and topics scheduled for the September 2011 workshop include:

- **Dr. Barry Boehm, USC, Center for Systems & Software Engineering**, 'Future Challenges for Systems and Software Cost Estimation and Measurement' (*Keynote Address*)
- **JoAnn Lane, USC, Center for Systems & Software Engineering**, 'System of Systems Cost Modeling Using COSYSMO'
- **Sherry Stukes and John Spagnuolo Jr., JPL**, 'Software Cost Estimating Using a Decision Graph — a Knowledge Engineering Approach' (*2011 Conference Software Track Best Paper*)
- **Joe Lavender, Consultant**, 'Conceptual Phase Software Simulation for Armored Vehicles'
- **Kent Joris, TASC**, 'Manufacturing Cost Estimating' (*Training Topic*)
- **Anandi Hira, USC Graduate Student**, 'Cost Modeling for Commercial Organizations'
- **Andy Prince, Chairman of the ISPA Board of Directors**, 'Plans for ISPA/SCEA Merger'

You may contact the USC registration point of contact, **Ms. Julie Sanchez** at: jasanche@usc.edu or (213) 740-5703 to register.

An optional tour of the campus will be held during the lunch break. As always, our workshops are free, however there will be an \$8.00 parking fee. At this workshop, morning and afternoon refreshments will be provided by USC. Lunch will be on your own. We will provide a listing of the campus food court offerings. There are all types of food to meet any dietary needs and any budget.

Our winter workshop planning is underway. It will be hosted by PRICE Systems in conjunction with the Los Angeles Air Force Base Space and Missile Systems Center (LAAFB SMC) and will be held 14 December 2011 at Fort Mac Arthur in San Pedro. Several other 'Best Paper' winners from the joint 2011 Conference are already scheduled to speak. More details will be available soon!

Please consider hosting a workshop or presenting at a workshop! It will be a rewarding experience. If you are interested in hosting a workshop, please contact **Kurt Brunner** at kbrunner@tecolote.com, **Quentin Redman** at quentin.redman@pricesystems.com, or **Sherry Stukes** at sherry.a.stukes@jpl.nasa.gov. Also, if you are interested in making a presentation at a workshop, please contact our Program Coordinator, **Henry Apgar**, at hapgar@mcri.com.

We look forward to seeing you at the next workshop!



Kurt Brunner

President,
ISPA Southern California Chapter
kbrunner@tecolote.com
(310) 536-0011 x144



Quentin Redman

Vice-President,
ISPA Southern California Chapter
quentin.redman@pricesystems.com
310-692-5926



Sherry Stukes

Secretary/Treasurer,
ISPA Southern California Chapter
sherry.a.stukes@jpl.nasa.gov
(818) 393-7517

Executive Manager's Introduction

By RICH HARWIN, ISPA EXECUTIVE MANAGER



I thought I would take this opportunity to introduce myself as ISPA's new Executive Manager. This is an interesting time to move into the post. The position requires that the manager provide a single interface with the SCEA Manager of Business in the Joint Office. I will be working jointly with the SCEA President to monitor the scope, quality and practices of the services that the Joint Office provides to our societies. And I will be responsible for the review and approval of the monthly activities, services provided, and financial transactions.

Over the course of the next couple years, as we move toward more joint activities and commonality and consider a potential merging of the two societies, there could be significant issues to be worked with both SCEA and the Office. Moving forward we will want to maximize the financial efficiencies of joint operations while maintaining the ISPA culture, interests and priorities.

I have served the Southern California Chapter Board as Track Chair and Elections Chair, I am currently in my second term on the International Board. In these experiences, along with my recent experience working as the 2011 Conference Co-Chair for ISPA, I believe I have formed a good relationship with both the Joint Business Office and with the SCEA Board of Directors. I look forward to working with them and serving our society in this capacity as we move forward. And I want to thank you for your support in this endeavor.

Mid-Atlantic Chapter News

By RON LARSON

For ISPA members located in the Greater-Washington, DC area: Long-time ISPA members might remember the Baltimore-Washington Chapter, which was active for several years until it was dissolved in the mid-1990's. The job-related demands on our members combined with the local traffic congestion made it nearly impossible to schedule meetings/seminars that could be widely attended. Our sister society, SCEA, currently holds monthly luncheon meetings at various locations, both inside and outside the Beltway. For those who haven't yet attended one of these sessions, I can assure you that you will find your investment in time most worthwhile. Attendance is free and a light lunch is available for a nominal fee. Check the e-mail meeting announcements and try to attend a meeting when it is held at a location convenient to your home or office. The speakers are always excellent and the topics are timely and relevant for all ISPA members. Please show your support for ISPA and the greater cost estimating community by attending. See you there!

TREASURER'S REPORT

This report is extracted from the presentation of Treasurer Bruce Minett at the ISPA Board of Directors on June 6, 2011. Bruce reported that as of the beginning of May 2011 the Society's financial balance totaled \$165,675. Over eight percent of this sum is invested in Certificates of Deposit at rates not now available. The remainder is in money-market funds and checking accounts.

Bruce also reported that for the first four months, revenues were \$6,256 and expenses were \$26,642. However, revenues did not reflect funds from the Albuquerque Joint Conference.

Planning & Resources

By GEORGE STRATTON

The Planning and Resources Committee is responsible for maintenance of the Society By Laws and its Constitution. Our Committee also assists the executive committee in putting together the required society five-year plan. The ISPA Five-Year plan tracks actual and projected Inflows (Receipts) and Outflows (Expenditures) through calendar year 2015. The plan is current as of the Conference. For the current year we project inflows of about just over \$71k and outflows of about \$77k (for reference, CY 2010 actual values were \$98k inflow and \$74k outflow).

Beyond 2011 the ISPA plan assumes continuation of the current society framework with the exception of the announced changes to the joint journal. In the event that a new society can be formed by the merger of ISPA with SCEA, we will bring to the merger a society that is financially healthy! Reserve funds are available to cover unevenness in conference revenues. Potential growth in membership and conference attendance could bring other out-year Net values into the black. For details contact a member of the ISPA Executive Committee.



Banquet Scene

Membership Report

BY STEVE STERK

The recent Joint ISPA SCEA conference is the focus of this issue. I am proud to report that the Membership team signed up two Life Members and ten Renewals. But first I'd like to take a moment and thank the staff. Great job to everyone for all of the hard work and dedication in making this year's conference a big success!

ISPA now has 344 members, 88 of whom are lifetime members and 256 annual members. We have 35 new members this year. Lisa Yedo at Ball Aerospace and Anthony Peterson (retired) are our newest lifetime members. If you are wondering about your ISPA membership and merger talks 'no worries'. Your ISPA membership will be 'Grandfathered-in' when the merger happens. But if your membership expires, you will not get important information when the mailings



come out. My message is: please do not delay, go to our web site at www.ispa-cost.org and renew your membership today!

The International Board of Directors

Notes from Arthur Griffiths: Continued from page 16.

project management must be brought to account". I wonder how long it will be before we hear the phrase 'don't blame me, the decision process took so long it delayed the programme and increased the cost'.

On the upside there is now a great deal of optimism that we will get the baseline right and with a degree of realism incorporated in the estimates. The cost analysts should now stand firm and not be swayed under pressure by claims of 'historical costs are not relevant to my programme' or 'we will not make the same mistakes again' (I could write a book on these types of comments). Once the challenge is complete then it will be up to the politicians and military leaders to make the hard decisions and stop deadwood programmes to give the essential ones a chance of success.

Arthur Griffiths
Decision Analysis Services Ltd.

has listened to last years' survey data and we are one step closer to merging ISPA and SCEA to become a single Professional Cost Society targeted for 2012 time frame. I believe a merger will strengthen both ISPA and SCEA as both societies complement one another. I foresee we will realize a stronger Certification and Training program together. Our colleagues in the United Kingdom are leading the charge, as the Ministry of Defense (MOD) has mandated that cost estimation and analysis must come from a certified professional. This has had an obvious effect of stimulating UK membership in ISPA.



Steve Sterk (CPP)
ISPA Membership Chair
 steve.a.sterk@nasa.gov
 (661) 276-2377

New Members

Carl Benson — BAE Systems

Julia Betts — Rolls-Royce Submarines

Anil Gupta —The Aerospace Corporation

Darrell Hamilton — Defense Acquisition University

Vicki Johnson — Cessna Aircraft Co.

Anthony Redfern — Rolls-Royce Submarines

Chris Runciman — Moltek Consultants

Andrew Sich — Palisade's Regional Manager

Robert Viglione — Tecolote Research Inc.

Alison Warden — Rolls-Royce Submarines

Peter Weltman — Parliamentary Budget Office

Tolga Yalkin — Parliamentary Budget Office

Leone Young — Student, Stevens Inst. of Technology

New Life Members

Anthony Peterson — retired

Lisa Yedo — Ball Aerospace

Ask a Parametrician — Q&A

EDITED BY JOSEPH W. HAMAKER, PhD, CPP



Do you have a knotty cost analysis problem? Something that you have been wrestling with but don't feel you know the best practice answer to? Well our **Ask a Parametrician Q&A** column is an opportunity for you to get considered answers from senior cost analysts. I will select a question, get it answered by an

expert and feature it with the answer in the next issue of PW. Come on! Let's see if you can stump our experts or if they can prove their mettle by answering your challenging questions.

Greg Hogan of the Air Force Cost Analysis Agency is making his second appearance in this column in as many years with the following question:

"I find myself developing a pre-PDR life cycle cost estimate for a complex EO satellite system. I frequently rely heavily on my DoD/NRO/NASA based parametric CERs for these types of estimates. Now that the program has signed a contract with a particular contractor, I have more insight into the proposed design solution. After a little bit more research I find the contractor is proposing a design somewhat 'analogous' in concept to a recent program. Because I want to model my specific contractor's cost with developing these complex solutions I decide to 'calibrate' my parametric CER to this known 'analogous' data point because this approach will allow me to model slightly different parameters and still be in family with my analogy system. Now here is my question: Do I apply my normal growth to the analogous design and how do I adjust my estimating uncertainty bounds to account for the fact that I calibrated to an analogous data point?"

I turned to Dr. Christian Smart of the Missile Defense Agency to answer this question. Dr. Smart writes:

"There are two sources of uncertainty that should be distinguished in this discussion. One is uncertainty about the model parameters (i.e. inputs or 'independent' variables) and the other is estimating uncertainty. Estimating uncertainty can be thought of as the uncertainty that is not explained by the model parameters (weight, heritage, etc.). It is variation about the trend line of the cost estimating relationship.

Calibration adjusts the cost estimating relationship so that it intersects the analogy. For an equation of the form $Y=aX^b$ this means an adjustment to the 'a' value of the equation. In his question, Greg is using one data point for an analogy but any number of data points can be used. Figure 1 shows an example of using three data points (A, B and C) and then calculating an average a-value for the calibrated CER.

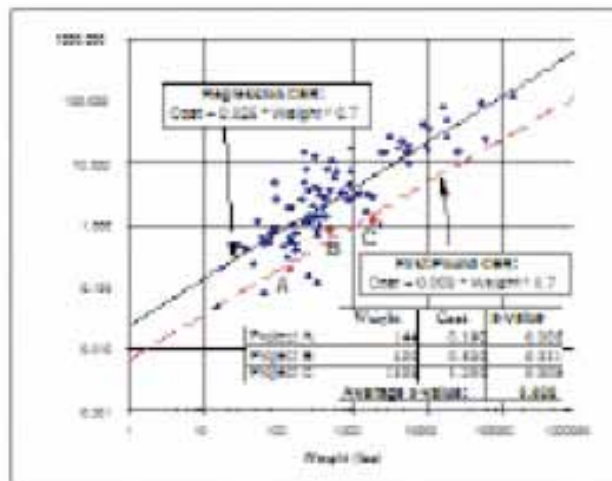


Figure 1. Example of CER calibration.

If you are adjusting the a-value of the equation, or calibrating, because you know something about the program that makes it more similar to what you are estimating than the average data point in the CER data set, then the estimating error should be reduced by this additional insight. In that case there should be additional information available to the estimator, and the estimator should believe he could improve upon the quality of the estimate by adjusting the a-value. Note that this estimating uncertainty is distinct from variation in the model parameters; this adjustment is to cut down the amount of estimating uncertainty. It is not reducing the amount of uncertainty in the model parameters, since the equation already reflects changes in cost due to changes in these parameters. Thus calibration only reduces estimating uncertainty. Parameter uncertainty should still be fully reflected in the cost risk estimate.

Understanding the extent to which estimating uncertainty is reduced can be understood by looking at the difference between the standard error of the estimate and the standard error of the slope. In the power equation $Y=aX^b$, calibration to a highly analogous data point should reduce most, if not all, of the uncertainty due to the a-value, or equation intercept, leaving only the standard error of the slope. When transformed linear least squares is used to estimate the equation's coefficients, there is a simple relationship, in log space, between the standard error of the estimate and the standard error of the slope. That relationship can be expressed mathematically as:

$$SE(b) = SE(Y)/\text{Sqrt}(SS(X))$$

That is, the standard error of the slope is equal to the standard error of the estimate divided by the square root of the sum of squares of the X-values and the average X-value. In the case of

Continued on next page.

a weight-based CER, $X = \text{weight}$. Note that the standard error is in \$ (or $\log(\$)$), so the standard error of the slope is in $\log\$/\log(\text{lb.})$, so in order to get the units back to $\log\%$, $SE(b)$ should be multiplied by the average of the log-transformed weights. This smaller uncertainty value can then be used to calculate the standard deviation of a lognormal distribution that reflects the adjusted slope-only estimating uncertainty of the CER.

However, the context for why the analogy varies significantly from the trend line should be understood. This difference could be due to differences in overhead rates or labor rates. For example, a satellite developed by a university using graduate students to design the bus should have lower direct and indirect labor costs than a prime contractor occupying expensive real estate and utilizing highly experienced engineers. If there is a logical explanation such as this one for the variation in cost from the trend line, then the standard error of the slope can be reasonably used to model estimating uncertainty. On the other hand if an analogy is selected simply due to superficial similarities, then care should be exercised in arbitrarily assuming that uncertainty will be reduced because of calibration.

For example, if you are estimating the cost for a mission planned for Mars, and an analogy is selected for calibration because the CER database includes both earth-orbiting satellites and planetary spacecraft, and there is only one Mars mission in the database, then the analogous data point should be researched in order to determine whether or not differences between the trend line and the cost for the analogy are due to well-understood programmatic factors, or because of cost growth experienced by the analogous program. For example, if the analogy is above the trend line because it experienced 100% cost growth, the confidence level of the point estimate should be adjusted to reflect this. Based on history, the confidence level for such a mission is quite high, above 90%, as discussed in my recent ISPA-SCEA paper, 'Covered with Oil: Incorporating Realism in Cost Risk Analysis'. Table 1 provides a set of confidence levels based on historical cost growth based on cost growth discussed in this paper.

Cost Growth	Confidence Level
<-10%	6%
-9.900%	18%
0.1%-10%	30%
10.1%-20%	43%
20.1%-30%	51%
30.1%-50%	64%
50.1%-75%	79%
75.1%-100%	84%
100.1%-150%	92%
150.1%-200%	95%
>200%	99%

Table 1. Historical cost growth and associated percentiles.

For the data summarized in this table, 30% of missions experienced cost growth less than or equal to 10%, which means if the analogous mission grew by 8%, it is reasonable to expect that the point estimate is close to the 30th percentile of the estimating uncertainty distribution. Once a confidence level is established, the standard error of the estimate can be used to determine a lognormal distribution that characterizes the estimating uncertainty. If X is equal to the Y th percentile, the log-space standard deviation q is equal to the standard error, and the log-space mean p can then be calculated as $p = \ln(X) + (z_y)q$

Where z_y represents the inverse of the standard normal distribution evaluated at Y . This is also known as the Z-score that used to be found in tables at the back of college textbooks on statistics.

The arithmetic space mean and standard deviation can be calculated from their log-space equivalents by solving the following formulas for $E(X)$ and $\text{Var}(X)$:

$$E(X) = \exp(p + 0.5q^2)$$

$$\text{Var}(X) = (\exp(q^2) - 1) \exp(2p + q^2)$$

As an example, if the point estimate is \$200 million and represents the 30th percentile, and the log-space standard error of the estimate is equal to 0.4, then

$$P = \ln(200) + 0.4 * z_{0.3} = 5.2983 + 0.4 * (-0.5244) \approx 5.0886$$

The mean and variance can be calculated using the formulas for expected value and variance listed above, to find that the mean is approximately \$176 million, and the variance is \$5,354 million, which means that the standard deviation is approximately \$73 million.

In summary, calibration has a significant impact on risk assessment. It does not affect parameter uncertainty, but should be used to adjust estimating uncertainty. If the calibration is done because the estimate varies from the trend line due to well-understood reasons that make it highly similar to what you are estimating, then the error about the slope should be used in place of the estimating error of the equation, making sure to adjust to the appropriate unit. However, if the analogy is chosen for more superficial reasons, the estimating error of the equation should be used, and the confidence level of the point, or non-risk adjusted, estimate should be set based on the cost growth of the analogous program, using the information in Table 1 to determine an appropriate confidence level for the mission being estimated."

So there you have it for this edition of "Ask A Parametrician." Please keep those good questions coming to:

joseph.hamaker@tmgi.net

BEST PAPER MODELS & METHODS TRACK

Trade Space, Product Optimization and Parametric Analysis

By DOUG HOWARTH, LOCKHEED MARTIN AERONAUTICS COMPANY

ABSTRACT

This paper shows how to bound, build and assemble trade spaces for product optimization. Trade space exploration typically has been the domain of engineering groups. However, rather than trailing such engineering studies, parametric analysts may be able to lead them. In the process, parametricians may be able to move their organizations toward more economically viable configurations, those that markets will more readily accept. New methods, explained in this paper, offer parametric analysts the ability to analyze trade spaces in a manner that allows them to determine product attribute sets that have the best chances for market success.

DEMAND

In order to analyze a trade space completely, one must be able to describe the demand in the market. For this paper, we will examine the market for Business Aircraft from 2002 to 2011 performed by Forecast International (FI). See Reference.

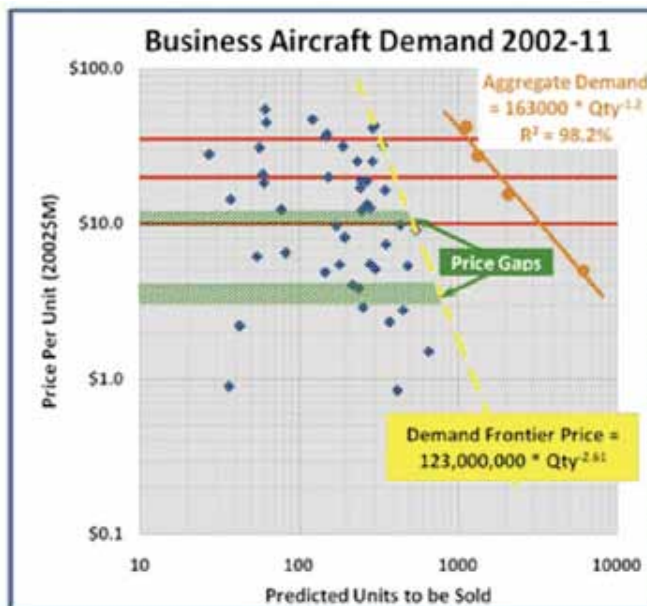


Figure 1: Dem and Frontier depicts market limits, Aggregate Dem and shows price responsiveness, Price Gaps are openings

Figure 1 shows that in 2001, for the upcoming decade,

there were 46 business aircraft models (the dark diamonds); these models had predicted sales figures in terms of quantity and price. Below a price of \$10 million, predicted sales were for 6153 vehicles at an average price of \$5.01M (this is lowest and rightmost circular dot on the chart). Between \$10 million and \$20 million, Forecast International's prediction was for 2064 units at an average price of \$15.6 million (the next highest circular dot). Continuing on, the next bin, with a lower bound of \$20 million and an upper limit of \$35 million, had 1335 units at an average price of \$27.4 million (the circular dot just below the highest circular dot). Finally, in the highest bin, those planes above \$35 million, the projection was for 1115 units at an average price of \$42.2 million (the highest circular dot). Running a regression through the circular dots yields an Aggregate Demand curve described by Equation 1:

$$= 163000 * \text{Quantity}^{-1.2} \quad (1)$$

Where:

= Median aircraft clearing price in 2002\$

Quantity = Projected sales from 1-1-2002 to 12-31-2011

While the Aggregate Demand curve shows the total sold by price group, another useful concept with respect to quantity limitations in the market is that of the Demand Frontier, both revealed in Figure 1. Note the quantity term in Aggregate Demand curve was several times the largest value for any individual aircraft model in each bin. Because of this phenomenon, while the Aggregate Demand curve slope provides insight into price responsiveness in the market, the quantity term loses meaning because no one manufacturer attains these figures. The Demand Frontier shows the market limits by either 1) running the Aggregate Demand curve slope through the rightmost point in the demand array, or 2) running a line through the two rightmost points in the demand array as in Equation 2 (by definition, no one sells more than the Demand Frontier, though analysis reveals that it moves over time):

$$\text{DFP} = 123,000,000 * \text{Quantity}^{-2.61} \quad (2)$$

Where:

DFP = Demand Frontier Price

Continued on next page.

Figure 1 identifies a pair of gaps, regions in the market in which there are no competitors with respect to price. Since the market has indicated its willingness to support vehicles above and below these price thresholds, it is reasonable to assume that with the proper mix of attributes, new vehicles could be successfully to the market in these regions. The question before us is this: what is the best mix of features for new aircraft for these areas?

VALUE

Understanding the importance how the market reacts to the products is central to understanding value analysis. Equation 3 mathematically describes a hypothesis about how the market so reacts, known as the Value Theory of Price Determination:

$$V_m = A_1 * A_2 * \dots * A_i * e_j \quad (3)$$

Where:

V_m = Median market value of aircraft (here, in 2002\$M)

A_i = contribution of ith attribute

e_j = error term of the equation

In other words, Equation 3 hypothesizes that product value in the business aircraft market is a combination of all factors that the market collectively deems important as they vote with the money that they provide to the market. Products priced higher than this collective wisdom will experience little or no sales. Producers making such products will find prices for them unsupportable, and will have to lower their sales prices. Products priced too low will experience brisk sales, perhaps so much so that the manufacturer will not be able to keep pace, and will therefore have to raise prices to avoid shortages. In this formulation there may be several elements contributing to the overall value of a product. While some attributes are more important than others are, ignoring significant effects may put the producers in financial peril.

The data reveals that at least five independent variables contribute to value: maximum cruise speed, passenger capacity, cabin height, range and number of engines, as per equation 4:

$$V_m = \text{Cruise MPH}^{0.820} * \text{Pass}^{0.441} * \text{Cabin Ht}^{1.72} * \text{Range}^{0.772} * \text{Number of Engines}^{0.385} \quad (4)$$

Equation 4 has an adjusted R2 of 98.1%, an F-statistic of 461 and a Mean Absolute Deviation of 10.7%, while the p-values for the independent variables Cruise MPH, Passenger Capacity, Cabin Height, Range and Number of Engines are 4.82E-8, 8.91E-7, 0.0001, 4.69E-10 and 0.002, respectively. We can use it to predict value.

NEW PRODUCT POSITIONING

Figure 1 revealed a pair of price gaps. No competitor had a product to offer in these regions. Model 41 bounds the bottom of the lower gap, at \$2.9 million, while Model 20 bounds the top of it, at \$3.86 million, as shown in Figure 2. The 'values' in Figure 2 are input variables to Equation 4 for a new hypothetical vehicle. By selecting a Cruise MPH value midway between the values for Models 40 and 41, as shown in the lower left corner of Figure 2, we move the targeted projected price to point between that for Models 40 and 41. By manipulating range and cabin height, we can find a configuration that is 50% of the price distance between Models 40 and 41, or \$3.38 million.

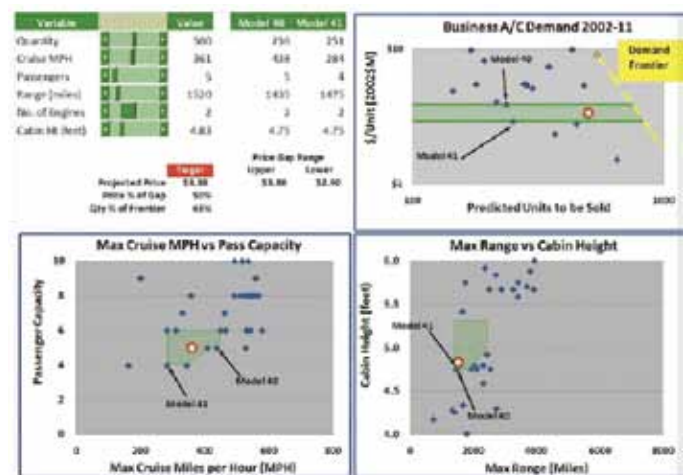


Figure 2. The low price gap and attribute maps of nearby competitors

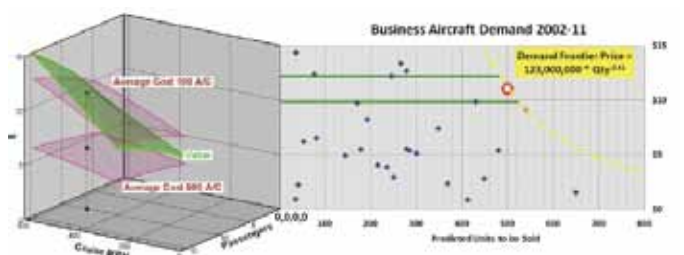


Figure 3. The upper gap in the 4D space, the value/cost space vs. Quantity, Passenger, Cruise MPH, with origin (0,0,0,0) representing a profit, look the previous 3D model and a 4th year space plot the demand frontier.

Once we have a hypothetical configuration, we can compare its value to its cost, as shown in Figure 3. Figure 3 reveals that the value/cost space on the left abuts the demand plane on the right, forming a four-dimensional system in which all the axes are positive, about an origin of (0,0,0,0). The object here is to provide a new vehicle that offers a set of features the market wants but does not have, at the greatest projected profit to the builder.

REFERENCES

Forecast International, The Market for Business Aircraft, 2002-2011, December 2001



***Proudly serving
our Federal Government
for over 60 years***

Wyle is one of the nation's leading providers of independent analytic, engineering and testing services to the Intelligence Community (IC) and the Department of Defense.

We are rapidly growing our cleared IC support team in the National Capital Region and are actively seeking qualified candidates to join our world-class team of professionals currently providing support in the following areas:

- ***Cost Estimating and Analysis***
- ***Budget Analysis***
- ***Financial Management***
- ***Acquisition Management***
- ***Earned Value Management***
- ***Program Control***
- ***Program Management***
- ***Strategy and Operations***

These positions require an active TS/SCI and Counter Intelligence (CI) Polygraph or Full Scope (FS) Polygraph or eligibility to obtain this level of clearance.

Wyle provides an employee friendly environment, exciting and challenging work, competitive salaries, and comprehensive benefits packages.

Let Wyle be the key that unlocks your future.



For more information about our current job openings visit our website at www.wyle.com or email your resume to aerorecruiting@wyle.com.

MEMBERSHIP APPLICATION

Date: _____ ☐ Renewal ☐ New Member ☐ Change of Address

Name: _____ Title: _____

Business Affiliation: _____ Voice: _____

Mailing Address: _____ Fax: _____

City, State, Zip, Country: _____ Email: _____

Alternate Address: _____ Home: _____

City, State, Zip: _____ Country: _____

Dues Amount (US\$): ☐ \$55.00 Annual Member ☐ \$100.00 Two-Year Member

☐ \$30.00 Student Member ☐ \$550.00 Life Member

Credit Card: ☐ Visa ☐ Mastercard ☐ American Express

Card Number: _____ Expiration Date: _____

Signature: _____

Amount Enclosed: \$ _____

Amount Charged: \$ _____

Make all checks payable to "ISPA". Send checks and correspondence to:

ISPA/SCEA Joint International Office

527 Maple Avenue East–Suite 301, Vienna VA 22180

Fax: (703) 938-5091



ISPA/SCEA Joint International Office

527 Maple Avenue East–Suite 301

Vienna, VA 22180

Phone: (703) 938-5090

Fax: (703) 938-5091

Web: www.ispa-cost.org