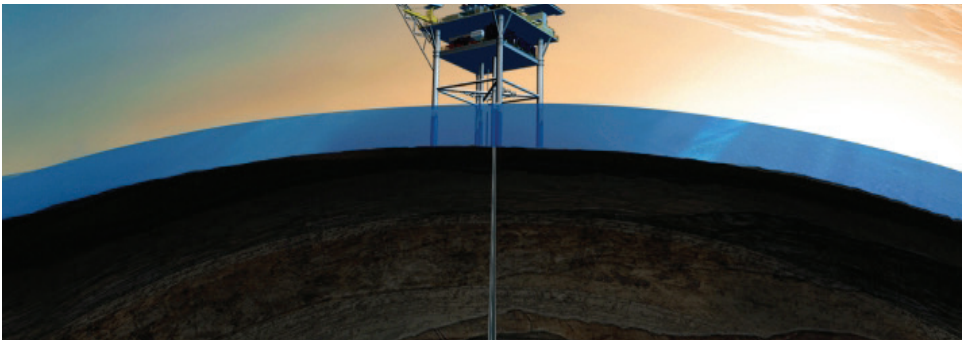
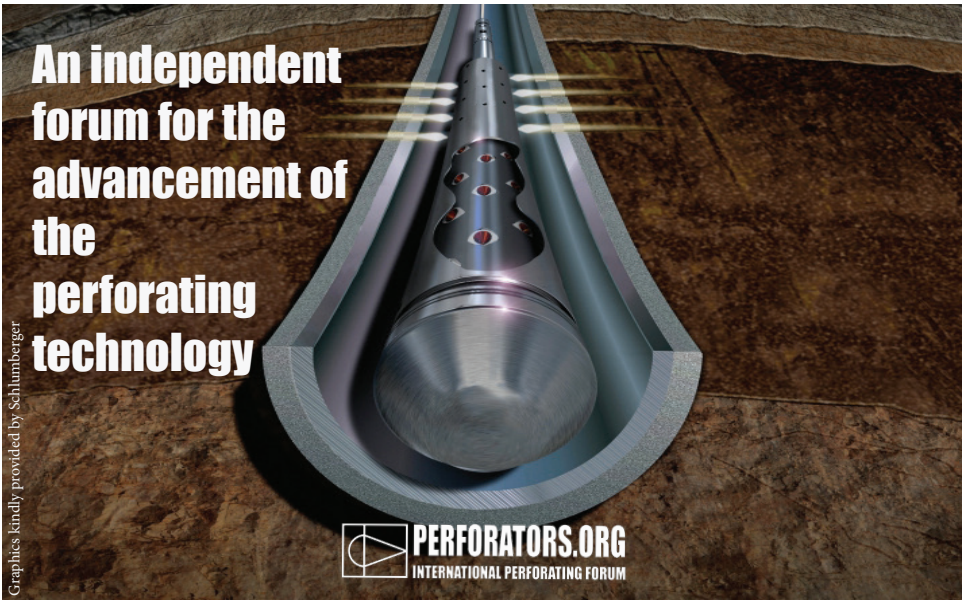


2016 INTERNATIONAL PERFORATING SYMPOSIUM

MAY 9TH-11TH, 2016

Moody Gardens Hotel, Galveston, Texas, USA



Agenda — Monday 9th and Tuesday 10th

Monday 9th Session 0

2:00 – 2:30 **Opening of Symposium and Safety Moment**
David Ayre (BP) & James Barker (Halliburton)

2:30 – 4:00 **Session 0: Explosives Safety and Novel Perforating Concepts**

IPS-16-04 **Ballistic Timed Delay Fuse Streamlines CT Perforating with Improving Safety and Reliability** Steven Henderson (Schlumberger)

IPS-16-15 **Successful Deployments of an Electro Hydraulic Firing Head in Norway**
Jim Gilliat (Baker Hughes)

IPS-16-17 **Unfavorable Trade-Off: High Temp Explosives vs Performance Sacrifice**
Liam McNelis (DynaEnergetics)

6:00 –10:00 **Dinner (Organizing Committee, Sponsors, and Authors only)**

Tuesday 10th Sessions 1-3

7:00 - 8:00 **BREAKFAST**

8:00 – 8:15 **Opening Remarks** Mark Brinsden (Shell)

8:15 – 9:45 **Session 1: Explosives Safety**

IPS-16-01 **API RP67 Oilfield Explosive Safety - Proposed Changes for the 4th Edition**
David Ayre (BP)

IPS-16-02 **Thermal Decomposition Progress with HMX Explosives**
Christopher Sokolove (Hunting Titan)

IPS-16-03 **Agitating Explosives in Extended Reach Wells - A Good Idea?** Kerry Daly (Expro)

9:45 - 10:00 **Coffee Break**

10:00 –12:00 **Session 2: Perforation Testing**

IPS-16-43 **Penetration Performance of a Shaped Charge Perforator in Sandstone and Limestone Targets at Extreme Pore Pressures and Constant Effective Stress**
Dennis Haggerty (Halliburton)

IPS-16-44 **API RP 19B Section 2 Perforation Tests Conducted at Multiple Facilities to Guide Latest Section 2 Revision.** David Ayre (BP)

IPS-16-45 **Developing Shaped Charges to Perform in Reservoir Rock**
Jim Gilliat (Baker Hughes)

IPS-16-46 **Consideration and Testing in Support of a Potential Standardized Perforator Hole Size Test** Shaun Geerts (Owen Oil Tools)

12:00 - 1:00 **LUNCH**

1:00 – 2:30 **Session 3: Operational Efficiency Improvements**

IPS-16-21 **A Step Change in Multistage Perforating** Pedro Hernandez (Schlumberger)

IPS-16-22 **Mitigating the Problems in Select-Fire Perforating Operations**
Josh Howk (Hunting Titan)

IPS-16-23 **Lowering Total Cost of Operations Through Higher Perforating Efficiency while simultaneously enhancing safety** JW Segura (Weatherford)

Agenda Tuesday 10th

Tuesday 10th Sessions 4 and 5

2.30 - 3:00 **Break**

3:00 – 4:00 **Session 4: Productivity Improvement Case Studies**

IPS-16-51 **Successful Execution of First Coiled Tubing Shoot and Pull Underbalance Perforation in Pakistan** Hassan Nazir (Schlumberger)

IPS-16-52 **Looking for optimal perforating techniques for best productivity in fields Kuil & Chuhuk, Asset ABKATUN Offshore Mexico** Servio Subiaur (PEMEX)

4:00 – 5:30 **Session 5: Poster Session (on the next page)**

5.30 - 7:00 **Break**

7:00 – 10:00 **Symposium Dinner, Keynote Address, and Industry Recognition Awards (all)**

1. **Keynote Address :** Dr. Daniel Hill
2. **Lifetime Achievement Recipients**
   - Mr. John Dees
   - Dr. Phil Halleck
   - Dr. John Schatz
3. **Industry Award:** Dr. David Leidel
4. **Safety Award:** Dr. Jim Brooks

Keynote Address and Industry Recognition Awards

Dr. Daniel Hill is Department Head and holder of the Stephen A. Holditch '69 Department Head Chair in the Harold Vance Department of Petroleum Engineering at Texas A&M University. Previously, he taught for twenty-two years at The University of Texas at Austin after spending five years in industry. He holds a B.S. degree from Texas A&M University and M.S. and Ph.D. degrees from The University of Texas at Austin, all in chemical engineering. He is the author of the Society of Petroleum Engineering (SPE) monograph, Production Logging: Theoretical and Interpretive Elements, co-author of the textbook, Petroleum Production Systems, 1st and 2nd editions, co-author of an SPE book, Multilateral Wells, and author of over 170 technical papers and five patents. He is a member of Society of Petroleum Engineers (SPE) and has received numerous SPE awards including the most recent one in 2014 for the SPE John Franklin Carll Award. He currently serves on the SPE Editorial Review Committee, the SPE Global Training Committee, and is a member of the SPE Board of Directors. Professor Hill is an expert in the areas of production engineering, well completions, well stimulation, production logging, and complex well performance (horizontal and multilateral wells), and has presented lectures and courses and consulted on these topics throughout the world.

Mr. John M Dees received his B.Sc in Chemical Engineering in 1975 from Southwestern Oklahoma State University, followed by his M.Sc in PE from University of Oklahoma in 1979. He joined Halliburton in 1975 as a Research Engineer & Chemist until 1980, and was a District Engineer from 1980-1981. Following this he held positions with Getty Oil, Oryx Energy / Sun Oil, until 1994. He formed his own company, DEES WELL COMPLETIONS in 1994, and consulted in the area of Well Completions until 2004, when he joined REEF EXPLORATION INC., eventually becoming Vice President of Operations and Engineering. He joined ENCANA OIL AND GAS (INC) USA in 2007 where he served as Completions Engineering Advisor until 2012. He is currently an Associate at Daneshy Consulting International. John has published 12 Technical Papers, Numerous Trade Journal Articles, and Master's Thesis, and holds 5 US Patents with several related foreign patents. He is well known for his work on Extreme Overbalanced Perforating, and development of Shale Completions.

Agenda Tuesday 10th

Keynote Address and Industry Recognition Awards

Dr. Phil Halleck received his PhD in Geophysics from the University of Chicago in 1973. His research includes a broad range of geotechnical and shock wave physics. At The Los Alamos National Laboratory he worked on explosives, rock physics research, geothermal energy, compressed air energy storage, coal mine subsidence, and unconventional gas resources. In the early 1980's, Dr. Halleck taught basic geology and geophysics courses at Penn State before entering the oil industry. He has worked with Schlumberger and TerraTek on shaped-charge oil-well perforators and other completions technology, including fracturing, sand control and acidizing. Since returning to Penn State in 1991, his studies have centered on use of X-ray CT to address formation damage and sand control problems, particularly damage caused by shaped charge perforators. His basic research interest lies in the general area of fluid flow in deformed porous media and reservoir rock.

Dr John Schatz holds a BS in physics and a PhD in geophysics from the Massachusetts Institute of Technology. He has specialized in rock physics, laboratory testing, data analysis, and computer applications for more than 40 years and has held a variety of positions with national laboratories and private sector employers including Lawrence Livermore National Laboratory, Terra Tek, Inc., and Science Applications International Corporation (SAIC). His roles have ranged from staff scientist to project manager to vice president. In 1989, Dr Schatz founded his own research company serving corporations, institutions and government agencies on a range of projects including a significant effort to support work on the US DOE's Waste Isolation Pilot Plant project. In 1990, he created his own dynamic event modeling software, which evolved into a software tailored to perforating event modeling. During the next 26 years, he performed significant research to expand the industry's ability to predict the complex dynamic events of perforating, and his work enabled substantial improvements in perforating efficiency, formation stimulation, and risk mitigation. During that time, he also authored numerous papers and continued to teach in the oilfield perforating segment as well as other industries. He is still engaged in consulting.

Dr. David Leidel holds B.S., M.S. and Ph.D. degrees from Drexel University with his doctoral dissertation subject being the design of directed energy explosive devices for underwater metal cutting. In his working career he has had twenty-eight years of experience in the design, development and testing of oilfield explosive systems for oil/gas well completion. Additionally he has served as chief engineer on a tri-service rocket system for a prime Government contractor and as a support engineer on military ordnance and space ordnance systems for Jet Research Center. As an industry representative to the Institute of Makers of Explosives (IME), Dr. Leidel has re-written and edited the Safety Library Publication 20 concerning the safe distances of electrically-initiated blasting operations from radio frequency fields. He chaired the sub-committee that developed IMESAFR, a risk analysis software program for the commercial explosives industry. He holds a number of patents and has written many technical papers in the field of energetic materials. He is currently the proprietor of a consulting business teaching courses in shaped charge technology.

Dr. Jim Brooks, PhD in mechanical engineering (acoustics), MBA in finance. Ten years' experience in underwater acoustics and anti-submarine warfare prior to joining Schlumberger in 1980 at the Perforating Center in Rosharon, Texas. During the 24 year career at Rosharon, held various technical and managerial positions within the Perforating Engineering Department, all keyed to the design and development of new perforating products, including shaped charges, guns systems, detonators and electronic perforating switches. Also helped develop a new seismic explosive called DBX for Western Geco. After retiring from the Perforating Center in 2004, co-founded PRJ Solutions, involved in consulting and the design of safer explosive systems.
During the past 36 years, has written several papers trying to understand and model the basic physics of the perforating process and its resulting fluid flow, and this remains an area of interest. Currently holds about 45 patents in a variety of perforating (and seismic) concepts. Now resides in Montgomery, Texas with wife, Carol, and dog, Simone.

Agenda Tuesday 10th

Tuesday 10th POSTER SESSION

4:00 – 5:30 **Session 5: Poster Session**

IPS-16-06 **Exposure of Time and Temperature Effects on HMX Explosive Powders**
Shaun Geerts (Owen Oil Tools)

IPS-16-07 **Institute of Makers of Explosives Safety Analysis for Risk (IMESAFR): A Quantitative Risk Analysis Tool for Analyzing Perforating Gun Safety**
Ronald Thomas (Institute of Makers of Explosives)

IPS-16-12 **Purpose-Designed Perforating Charge Delivers Superior and Consistent Performance in Hydraulic Stimulation Operations in the Williston Basin**
John Pinkett (Halliburton)

IPS-16-13 **Improved Frac Efficiency Using Focused Perforating**
Hema Prapoo (Allied Horizontal Wireline)

IPS-16-18 **The Development and Deployment of and Ultra High Pressure TCP System in the Gulf of Mexico** Charlie McClean (Baker Hughes)

IPS-16-19 **A Method Of Mapping And Perforating Wells With Fiber Optics Outside Casing On Wireline.** Guy Hadsall (Hunting Titan)

IPS-16-20 **6 -3/4-in. Industry Leading Gun System for HP Sand Control Applications**
David Suire (Halliburton)

IPS-16-24 **Field Trial Results from a Pumpdown Tension Tool**
Cort Peavy (Impact Selector International)

IPS-16-25 **Innovative Pump Down Solutions Reduce Nonproductive Time by Eliminating Coil Tubing Perforation and Helping Reduce Pump Down Fluid Requirements**
Jim Hill (Halliburton)

IPS-16-26 **Field Application Study of Zinc Based, Low Debris Perforating Charges**
Steven Zuklic (Baker Hughes)

IPS-16-27 **Perforation Systems for Plug and Abandonment Applications**
Nathan Clark (GEODynamics)

IPS-16-32 **Numerical and experimental study on the high strain rate deformation of tubes for perforating gun applications** Maurizio Bellingardi (Tenaris Dalmine S.p.A.)

IPS-16-33 **An Adaptive Shock Absorber for Perforating Gun Shock**
Haifeng Zhao and Alex Lee (Schlumberger)

IPS-16-34 **Computations of the Stress on a Fluid-filled Gun for Survival** Stuart Wood (Halliburton

IPS-16-39 **Plastic Collapse Behaviors of Perforating Guns with Scallops**
Haifeng Zhao (Schlumberger)

IPS-16-40 **TCP Debris Sub Ultimate Strength for Recovery Operation**
Haifeng Zhao (Schlumberger)

IPS-16-41 **A New FEA Model to Understand Perforating Structural Failure**
Gerald Craddock (Halliburton)

IPS-16-42 **Underbalance Optimization using a Laboratory-Based Fast Computational Model**
Derek Bale (Baker Hughes)

IPS-16-47 **Operator Uses Advanced Perforation Flow Laboratory to Support HMX Perforating by Coiled Tubing in HP/HT Field** Dennis Haggerty and Jacob McGregor (Halliburton)

IPS-16-48 **The Effects of Hydrostatic Pressure on Limited Penetration Perforating Systems**
James Kinsey (Owen Oil Tools)

IPS-16-49 **New Insights into Optimizing Perforation Clean Up and Enhancing Productivity with Zinc-Case Shaped Charges** Rajani Satti (Baker Hughes)

IPS-16-50 **Testing to Optimize Perforating Strategy in Shallow, High Viscosity Oil Wells - Through Enhanced API RP 19B Section IV Data and Results** Kevin Harive (Halliburton)

Agenda Wednesday 11th

Wednesday 11th Sessions 6-9

7:00 – 8:00 **BREAKFAST**

8:00 – 8:15 **Opening Remarks** David Ayre (BP) & James Barker (Halliburton)

8:15 – 9:45 **Session 6: Safety and Novel Perforating Concepts**

IPS-16-05 **Improved Process Yields Extreme Temperature Detonators**
Jonathon Bragg (Pacific Scientific)

IPS-16-14 **Innovative Solution Delivers First Ever Acoustically Initiated TCP Firing Head**
Kevin Harive (Halliburton)

IPS-16-16 **Acoustic Firing for Selective Reservoir Connection**
Jose Escudero (Schlumberger)

9:45 – 10:00 **Coffee Break**

10:00 – 12:00 **Session 7: Perforation Dynamics**

IPS-16-28 **Economical & repeatable method of obtaining dynamic underbalance**
David Cuthill (GEODynamics)

IPS-16-29 **Simulating Perforating Shock on an Intelligent Completions Interval Control Valve**
James Wight (Halliburton)

IPS-16-31 **Physics of under balance in TCP operation** Hanaey Ibrahim (PDO)

IPS-16-30 **Automatic Release Anchored Gun String Dynamics under Perforating Shock**
Haifeng Zhao and Mohamed Mehdi (Schlumberger)

12:00 – 1:00 **LUNCH**

1:00 – 2:00 **Session 8: Perforation Modeling**

IPS-16-36 **Next-Generation Dynamic Event Model for Perforated Completions**
Derek Bale (Baker Hughes)

IPS-16-37 **A new method for predicting perforation entrance hole diameter**
David Cuthill (GEODynamics)

2:00 – 2:30 **Break**

2:30 – 4:30 **Session 9: Multistage Completions**

IPS-16-08 **Statistics Based System Design for Perforated Clusters** John Hardesty (GEODynamics)

IPS-16-09 **A Novel Frac-Optimized Perforating System for Unconventional Wells: Development and Field-Trial** Rajani Satti (Baker Hughes)

IPS-16-10 **Advancing Consistent Hole Charge Technology to Improve Well Productivity**
Christopher Sokolove (Hunting Titan)

IPS-16-11 **Perforating Charges Engineered to Optimize Hydraulic Stimulation Outperform Industry Standard and Reactive Liner Technology** John Pinkett (Halliburton)

4:30 – 5:00 **Closing Remarks – Door Prizes**
David Ayre (BP) & James Barker (Halliburton)

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