

# BJRS 2020

BOLTED JOINT RELIABILITY SYMPOSIUM

CONFERENCE

October 1–3, 2019

EXHIBITION

October 1–2, 2019

Norris Conference Center  
Houston, Texas, USA

# Program

The American Society of Mechanical Engineers®  
ASME®

ASME  
SETTING THE STANDARD

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## 2019 BJRS TECHNICAL PROGRAM COMMITTEE

### JERRY WATERLAND, CHAIRMAN

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#### ASME

On behalf of ASME and the organizing committee, it is with great pleasure to welcome you to the Bolted Joint Reliability Symposium (BJRS). This international event is the first in a new ASME conference series that will focus exclusively on Bolted Flange Connections. The main objective of this conference is to present in one venue, the advances around the world in the design, component selection, assembly and troubleshooting of Bolted Flange Connections that have been made in the last decade.

This 2019 BJRS is the result of the great effort of the technical program committee whose names are listed in the program and for whom I want to express my gratitude. I would like to acknowledge the special contributions of the ASME Pressure Vessels & Piping Division, and specifically the Bolted Joints Technical Committee. I want to also express my thanks to Jaime Hart, the ASME Senior Staff member who handled all of the “behind the scenes” details and made all the necessary arrangements. I know she will be of great help to you if you have any questions or needs before, during or after the Symposium. I would also like to express our appreciation to the sponsors of the conference.

In addition to the technical program that includes twenty eight technical presentations, we have two panel sessions; one on the second day of the Symposium and one on the third day. Of special interest to everyone in attendance, there are many major suppliers to the BFC industry who are attending and participating as exhibitors; demonstrating and discussing their unique technologies and expertise.

All technical presentations and both tutorials will be included on a memory stick and available to all attendees. Last but not least, I would like to thank all the authors, the reviewers, the session chairs and all the participants. I sincerely hope that you enjoy the technical presentations, discussions, exhibits and social program, and that you find your participation in 2019 BJRS to be very worthwhile.

#### Jerry Waterland

Conference Chair

## CONFERENCE ORGANIZING COMMITTEE

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#### Jerry Waterland

Conference Chair

Session 1-1 Understanding BFC Design Methods Organizer

Session 5-1 BFC Assembly Organizer

#### Clay Rodery

PVP Awards Chair

Session 6-1 BFC Lessons Learned Organizer

#### Hakim Bouzid

PVP Division Chair

Session 2-1 Gasket Testing Organizer

Session 7-1 LDAR/Emissions Organizer

#### Warren Brown

Session 3-1 Gaskets/Technology Organizer

Session 4-1 Fasteners Organizer

#### Jim Kaculi

PDEC Member

Sessions 8-1 High Temperature/High Pressure Technology Organizer

#### Dan Peters

Conference Organizer and PVP Senator

# Technical Sessions

TUESDAY, OCTOBER, 01

## Track 1 Understanding BFC Design Methods

### 1-1 UNDERSTANDING BFC DESIGN METHODS

Houston, Norris Conference Center, Magnolia 8:45am - 10:15am

Session Organizer: Jerry Waterland, VSP Technologies, Prince George, VA, United States

**On the ASME proposed New Flange Design Rules Based on Tightness Technical Publication.** BJRS2019-7032

Hakim Bouzid, Ecole Technologie Superieure, Montreal, QC, Canada

**Tightness-Based Design of Bolted Flanged Joints**

Oral Presentation. BJRS2019-7017

Manfred Schaaf, amtec GmbH, Lauffen, OO, Germany

**A Comparison between Current BFJ Design Methods**

Oral Presentation. BJRS2019-7014

Warren Brown, Integrity Engineering Solutions, Dunsborough, WA, Australia

## Track 3 Gaskets and Packings

### 3-1 GASKET TESTING

Houston, Norris Conference Center, Magnolia 10:45am - 12:15pm

Session Organizer: Hakim Bouzid, Ecole Technologie Superieure, Montreal, QC, Canada

**Performance Testing per ASME B16.20 (2017)**

Oral Presentation. BJRS2019-7030

Joel Baulch, Teadit North America, Pasadena, TX, United States

**Effect of Heating Rate and Gasket Stress at Assembly on Hot Blowout Test**

Oral Presentation. BJRS2019-7016

Ming-Hang Yang, Nicholas Wheeler, Garlock Sealing Technologies, Palmyra, NY, United States

**Room Temperature Tightness Test (ROTT) ? Derivation and Use of Gasket Factors**

Oral Presentation. BJRS2019-7019

Adam Arnett, amtec North America, Inc., Athens, OH, United States,

Manfred Schaaf, amtec GmbH, Lauffen, OO, Germany

## Track 3 Gaskets and Packings

### 3-2 GASKETS/TECHNOLOGY

Houston, Norris Conference Center, Magnolia 1:15pm - 3:15pm

Session Organizer: Warren Brown, Integrity Engineering Solutions, Dunsborough, WA, Australia

**Performance of Semi-Metallic Gaskets with Nubbins**

Oral Presentation. BJRS2019-7004

Robert Taylor, 3S Superior Sealing Services, Houston, TX, United States,

David Fairbanks, Sinclair Oil, Sinclair, WY, United States

**Stress Multiplier for Segmented Gaskets**

Oral Presentation. BJRS2019-7003

Jeffery Wilson, Jerry Waterland, VSP Technologies, Prince George, VA, United States

**Characteristics, Manufacturing and Performance Capabilities of Flexible Graphite Gasket Materials**

Oral Presentation. BJRS2019-7036

Michael Sautter, Klingler, Gumpoldskirchen, Austria

**Combined Statistical-Mechanical Characterization of a Next Generation Textured PTFE for Extreme Environments**

Oral Presentation. BJRS2019-7026

Sannmit Shinde, University of Central Florida, Orlando, FL, United States,

Ali Gordon, Matthew Lopez, Lauren Culibao, Dominic Devito, Univ

Of Central Florida, Orlando, FL, United States, James Drago, Garlock,

Macedon, NY, United States, Paul Nichols, Garlock, Palmyra, NY, United

States, Zachary Poust, Ming-Hang Yang, Garlock Sealing Technologies,

Palmyra, NY, United States

## Track 4 Fasteners

### 4-1 FASTENERS

Houston, Norris Conference Center, Magnolia 3:45pm - 5:15pm

Session Organizer: Warren Brown, Integrity Engineering Solutions, Dunsborough, WA, Australia

**Are There Nut factor Differences at Several Elevated Temperatures on Anti-Seize Compounds**

Oral Presentation. BJRS2019-7035

Donald Oldiges, Jet-Lube, Fate, TX, United States

**The Effects of Fluoropolymer Coated Fasteners on Nut Friction Factors**

Oral Presentation. BJRS2019-7034

Karson Clark, VSP Technologies Inc., Prince George, VA, United States

**Kolsterising Surface Hardening of Stainless Steels**

Oral Presentation. BJRS2019-7040

David Cummings, Bodycote, Inc., Houston, TX, United States

**WEDNESDAY, OCTOBER, 02**

## Track 9 Tutorials

**9-1 TUTORIAL #1: WRC 538 BACKGROUND AND APPLICATION OF WRC 538 FOR DETERMINING FLANGE STRENGTH**  
Houston, Norris Conference Center, Magnolia **8:15am - 9:30am**

## Track 2 BFC Assembly

**2-1 BFC ASSEMBLY**  
Houston, Norris Conference Center, Magnolia **10:00am - 12:30am**

**Session Organizer:** Jerry Waterland, *VSP Technologies, Prince George, VA, United States*

**Evaluation of the Optimum Target Assembly Bolt Load for Some ASME B16.47 Series B Flange Joints**

**Oral Presentation.** BJRS2019-7011

**Abdelgader Abdelgalil, Gys van Zyl, Sabic, Jubail, Saudi Arabia**

**Experience with Alternative Assembly Patterns for Bolted Flanged Joints**

**Oral Presentation.** BJRS2019-7020

**Anita Bausman, VSP Technologies, Kingsport, TN, United States**

**Common Problems and Pitfalls with Current Joint Assembly Methods and Procedures**

**Oral Presentation.** BJRS2019-7015

**Warren Brown, Integrity Engineering Solutions, Dunsborough, WA, Australia**

**ASME L&D Qualified Bolting Specialist Course - Status and Upgrades**

**Oral Presentation.** BJRS2019-7028

**David Lay, Hytorc, Highland, UT, United States**

**ASME - Bolting Safety**

**Oral Presentation.** BJRS2019-7024

**Jay Knudsen, HYTORC USA, Conroe, TX, United States**

## Track 6 BFC Lessons Learned: Product or application case histories

**6-1 BFC LESSONS LEARNED**  
Houston, Norris Conference Center, Magnolia **1:30pm - 3:00pm**

**Session Organizer:** Clay Rodery, *C&S Technology LLC, League City, TX, United States*

**Lessons Learned in Ensuring Reliability and Performance of Chemical Process Bolted Flanged Connections**

**Oral Presentation.** BJRS2019-7039

**Chris Cary, DOW Chemical, Cincinnati, OH, United States**

**Lessons Learned: Top 5 Joint Integrity Issues for Refinery and Petrochemical Plants**

**Oral Presentation.** BJRS2019-7012

**Warren Brown, Integrity Engineering Solutions, Dunsborough, WA, Australia**

**Refinery Site Experiences in Implementing a Bolted Flange Joint Program**

**Oral Presentation.** BJRS2019-7025

**Stefan Smith, CITGO Petroleum Corporation, Lake Charles, LA, United States**

## Track 5 LDAR/Emissions Compliance

**5-1 LDAR/EMISSIONS**  
Houston, Norris Conference Center, Magnolia **3:30pm - 5:00pm**

**Session Organizer:** Hakim Bouzid, *Ecole Technologie Superieure, Montreal, QC, Canada*

**An Historical Perspective on the Basis and ASME Code Approach with M&Y Gasket Factors, their Use and Limitations, and the Resultant Impact on the Difference between Design Bolt Loads and Assembly Bolt**

**Oral Presentation.** BJRS2019-7033

**RANDY WACKER, Inertech, Inc., NEWARK, DE, United States**

**Use of a Leak Rate Model to Develop Gasket Tightness Guidance**

**Oral Presentation.** BJRS2019-7009

**Dale Rice, VSP Technologies, Leland, NC, United States, Jerry Waterland, VSP Technologies, Prince George, VA, United States**

**Best Practices for Valve Packing Installation for Fugitive Emission Compliance**

**Oral Presentation.** BJRS2019-7029

**Joel Baulch, Teadit North America, Pasadena, TX, United States**



# Technical Sessions

**THURSDAY, OCTOBER, 03**

## Track 9 Tutorials

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**9-2 TUTORIAL #2- ASME PCC-1-2019 UPDATES, APPENDIX A ACCEPTANCE AND USE, CURRENT RESEARCH**  
Houston, Norris Conference Center, Magnolia **8:15am - 9:30am**

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## Track 8 Design and Testing of HPHT Flanges for Oil and Gas Applications

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**8-1 HIGH TEMPERATURE/HIGH PRESSURE TECHNOLOGY**  
Houston, Norris Conference Center, Magnolia **10:00am - 12:30pm**

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**Session Organizer:** Jim Kaculi, *Dril-Quip Inc., Houston, TX, United States*

### **Bolt Creep Relaxation in High Temperature Joints**

**Oral Presentation.** BJRS2019-7038

**Warren Brown,** *Nathan Knight, Tze-Yew Lim, Integrity Engineering Solutions, Dunsborough, WA, Australia*

### **New Subsea HPHT Flange Design Verification Analysis and Validation Testing Methodology**

**Oral Presentation.** BJRS2019-7021

**Mark A. Manning,** *Dril-Quip, Houston, TX, United States,* **Andrew Grohmann,** *Dril-Quip, Inc., Houston, TX, United States*

### **Influence of Thermal Gradients in Design Verification of Uninsulated HPHT Bolted Connections**

**Oral Presentation.** BJRS2019-7027

**Tom Luce, James Stevens,** *OneSubsea, Houston, TX, United States*

### **Lessons Learned: Top 5 Joint Integrity Issues for LNG Plants**

**Oral Presentation.** BJRS2019-7013







**Warren Brown,** *Integrity Engineering Solutions, Dunsborough, WA, Australia*

### **Deformation and Stresses Generated on the Bolted Flange Joint Assembly and the Grayloc Clamp Connector at Elevated Temperatures**

**Oral Presentation.** BJRS2019-7001

**Mustafa Mogri,** *DHA Suffa University, Karachi, Sindh, Pakistan*

## BJRS 2019 Sponsorships &amp; Exhibitors

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|---|--|
|    | <p>Applied Bolting Technology: Manufacturer of Direct Tension Indicators for use in single pass flange tightening &amp; structural systems.</p>  |
|    | <p>Flexitallic is the industry leader and sealing expert in manufacturing metallic, semi-metallic and sheet gaskets for all industries. Developer of the spiral wound gasket in 1912, Flexitallic is synonymous with quality and innovation; proven true by their revolutionary products such as Thermiculite®, Change®, and Change-HF® gaskets. Flexitallic offers a variety of products for multiple industries globally. Stop by their booth and see for yourself why Flexitallic is the most trusted name in industrial sealing.</p>   |
|    | <p>3S - Superior Sealing Services is a leading manufacturer of high quality sealing products for the industrial market. Our commitment to quality starts from raw materials to finished goods by providing full traceability for each alloy and stainless parts through laser etch heat numbers along with the use of superior grade of inhibited graphite. We offer a comprehensive product line including spiralwound, kammprofile, corrugated metal, double jacketed, and sheet material to address sealing applications.</p>   |
|   | <p>"Inertech, Inc. has grown to be one of the largest global suppliers of expanded PTFE materials and specialty gaskets under the Inertex brand name. Established over 25 years ago and headquartered in Monterey Park, California, Inertech offers innovative sealing solutions derived from years of experience in nearly all types of plant environments including Chemical Processing, Pulp and Paper, Food and Beverage, Pharmaceutical, Aerospace, OEM's and more. At Inertech, we are TESTED AND PROVEN."</p>   |
|  | <p>Integrity Engineering Solutions is a niche engineering consulting firm dedicated to applying advanced, practical knowledge to the solution of the most difficult engineering problems in the Oil &amp; Gas, Refining, Petrochemical, Minerals Processing and Mining industries. We are specialists in assessment techniques for Design, Fitness-For-Service, Failure Analysis, Inspection, Reliability, Repair and Modification of Fixed Equipment. We are world leaders in the field of Pressure Boundary Joint Integrity and Bolted Joint Assembler Training.</p>   |
|  | <p>HYTORC makes industrial bolting safer and simpler. With 50 years of experience focused entirely on developing the highest quality industrial bolting systems, HYTORC is the most trusted name in the industry. From steel mills and mining equipment to refineries, power plants, and wind turbines; we have developed solutions for every bolting application imaginable. For custom projects, our highly experienced engineering team is at your service to design the most efficient solution for your job with simple operation and economical pricing in mind.</p>   |
|  | <p>Thermoseal Inc., An Independent Klinger Company, is a leading manufacturer and distributor of fluid sealing materials and fluid control products. KLINGER is a world-leading developer and manufacturer of fluid sealing and fluid control products founded in 1886 by Austrian engineer, Richard Klinger. KLINGER operates 60+ manufacturing, distribution and service hubs in over 40 countries worldwide. Our products can be found in most all industrial and manufacturing applications including chemical processing, power generation, oil and gas, food and beverage, Original Equipment Manufacturing, and Aftermarket applications. For over 130 years, KLINGER gaskets have been meeting the toughest sealing demands with quality, integrity and performance.</p> |
|  | <p>TEADIT® is recognized worldwide as a leader in the development and manufacturing of innovative products for critical fluid sealing processes. Teadit® has helped key industries achieve the goal of an emission-free environment within their facilities. Teadit® is constantly investing Application Engineering and in Research and Development to keep up with the evolution of the industry's needs. TEADIT® North America is located in Houston with worldwide locations in South America, Europe and Asia.</p>  |
|  | <p>VSP Technologies is an engineering-focused company dedicated to saving our client time and money by supplying and supporting their site's gasket, packing, and expansion joint needs. With backgrounds in engineering, manufacturing, fabrication, distribution, and field services, our staff is uniquely suited to handle any fluid-sealing need or requirement. Our innovative, comprehensive fluid-sealing management programs are designed to increase performance and reliability of customer's equipment, saving time, effort, and money.</p>  |

Thank you

PLATINUM



GOLD



EXHIBITORS

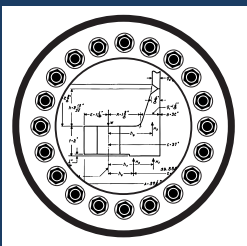












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