STRUCTURAL INTEGRITY (SI) 2018
1ST INTERNATIONAL CONFERENCE ON STRUCTURAL INTEGRITY FOR OFFSHORE ENERGY INDUSTRY
6-7 SEPTEMBER 2018

DOUBLETREE BY HILTON
161 SPRINGFIELD ROAD
ABERDEEN, UK

PROGRAMME
ABOUT SI 2018

The marine, offshore and subsea energy industry continues to evolve creating new challenges and risks for the safety, integrity and reliability of its structures and systems. For example, wells are being drilled at greater depths, pressures and temperatures, requiring enhanced assessment of the integrity of structures and systems in such extreme conditions. There is a push to expand operations into new locations such as the Arctic, where environmental and operational conditions are considerably harsher. Many assets in the North Sea are rapidly reaching or have already exceeded their original design life and safe but affordable life extension and decommissioning are becoming major objectives. The recent rapid developments in renewable energy technologies have introduced new challenges of maintaining at minimum cost the reliability and integrity of structures and equipment in remote locations and subjected to extreme loads and environmental conditions. There are also exciting new opportunities, but also significant challenges and uncertainties, in applying structural health and condition monitoring, robotics and the novel concepts of additive manufacturing and big data to safety and structural integrity. These and many additional traditional and emerging themes will be covered during the conference through survey, focused and/or case study presentations from the practitioners and researchers in the art and science of structural integrity.

The conference will bring together researchers and practitioners to discuss and address the current and emerging issues and challenges, as well as share successes and state-of-the-art and practice, in structural integrity, safety and reliability of energy industry’s marine, offshore and subsea structures and systems. It will feature keynote and invited papers providing broader overviews of the main contemporary themes as well as more focused presentations addressing specific issues of practical relevance. Ample opportunities for informal discussions, sharing of insights and networking will be available.

Special Issues of International Journal of Fatigue, Elsevier & Journal of Structural Integrity and Maintenance, Taylor & Francis

A special issue of Elsevier’s International Journal of Fatigue will be published comprising extended versions of selected papers focusing on fatigue and presented at the Conference. Click HERE to access the call for papers.

Conference Themes
- Fatigue, fracture, corrosion, erosion and abrasion
- Deterministic deterioration models and analysis
- Probabilistic deterioration models and analysis
- Dealing with uncertainty in structural integrity assessment
- Structural integrity under extreme loads and in extreme environments
- Probabilistic computational mechanics and numerical methods
- Structural integrity of fixed, floating and submerged structures
- Structural integrity of wells, pipes and risers
- Structural integrity of wind and tidal turbines and wave energy extractors
- Life-cycle assessment, asset integrity management decisions and optimization
- Safe and efficient asset life extension
- Reusable structures and repowering
- Structural integrity in decommissioning
- Design for integrity, inspectability and extended safe lifespan
- Component and system reliability
- Multi-scale material, defect and damage modelling
- Structural health and condition monitoring
- Non-destructive testing and evaluation
- Intelligent use of monitored data
- ‘Digital twins’ for structural integrity
- Structural integrity of additively manufactured materials
- Integrity protection technologies
- Industry codes and guidelines
- Case studies in structural integrity, safety and reliability

Registration Fees
- Full Registration: £400
- Student Registration: £200

Organising Committee

Prof Purnendu Das
ASRANet Ltd, UK

Dr Piotr Omenzetter
The University of Aberdeen, UK
08:00-08:55 Delegate Registration

08:55-09:00 Welcome Address: Piotr Omenzetter UNIVERSITY OF ABERDEEN, UK

09:00-09:40 Probabilistic Design and Risk-Based Inspections of Offshore Wind Turbines and Subsea Wells

**Keynote:** Aalborg University, Denmark

**Beechwood Suite - Session 1:**

09:40-10:20 Developments in BS 7910 (Guide to methods for assessing the acceptability of flaws in metallic structures) for the offshore industry

**Keynote:** TWI, UK

10:20-10:50 Break

10:50-11:10 Application of novel technologies for structural integrity assessment involving structural health monitoring, machine learning and the concept of a true digital twin

**Invited:** Ramboll, Denmark

11:10-11:30 Clearer communication of Structural Integrity using Performance-Based methodology and terminology

**Invited:** BP, UK

11:30-11:50 Fracture integrity assessment of offshore pipelines subject to complex in-service loading conditions

**Invited:** Wood, UK

11:50-12:10 Risk Based Optimization of In-Service Inspection of Fatigue Cracks and Maintenance for Coating and Corrosion In Tanks

**Invited:** DNVGL, Norway

12:10-12:30 Unmanned Aerial Vehicle Benefit Assessment for the Structural Integrity Management of Wind Turbines

**Technical University of Denmark, Denmark**

12:30-13:30 Lunch

**Session 2**


**University of Aalborg, Denmark**

13:50-14:10 Comparing Small-Scale Testing Approaches to Determine Crack Arrest in High Strength Steel

**TWI, UK**

**McDermott Middle East Inc, UAE**

14:10-14:30 Mechanical Properties of High Yield-to-Tensile Ratio High Strength Steels Under Service Loading and the Structural Implication

**Brunel University & NSIRC, UK**

**The Welding Institute (TWI) Cambridge, UK**

**Brunel University London, UK**

**Lloyds Register Global Technology Centre, Southampton, UK**

14:30-15:00 Break

15:00-15:20 Residual Compressive Stress as a crack repair in maritime structures

**Fatigue Technology USA**

15:20-15:40 Structural Reliability Assessments of fixed offshore structures: some considerations for enhancing system strength and quantifying its uncertainty

**GS Offshore Engineering, UK**

**Atkins, UK**

15:40-16:00 Probabilistic Modelling of Scaling for Sub-Surface Well: Case Study on Danish North Sea Wells

**Aalborg University, Denmark**

16:00-16:20 Fatigue Life Estimation Under Mutiaxial Loading Using a New Critical Plane Orientation

**University of Stavanger, Norway**

16:20-16:40 Condition Indicators for Head Wells Subject to Deterioration

**Aalborg University, Denmark**

16:40-17:00 Strengthening mitigations for offshore jacket structures: A conceptual framework and its application

**University of Stavanger, Norway**

17:00-17:20 Hybrid Approach to Structural Reliability Assessment,

**National University of Singapore, Singapore**

**Southeast University, China**

**Nanjing Forestry University, China**

19:00 Conference Dinner—Doubletree by Hilton
08:50-09:10  A Blueprint for Digital Twins in Structural Integrity Management,  
Team Lead, Fixed and Floating Structures, DNV GL

09:10-09:30  A new conservative method for estimation of the fatigue lifetime in offshore tubular T joints  
University of Aberdeen, UK

09:30-10:00  BREAK

10:00-10:20  Development of a multi-scale surrogate-based tool for composite property estimation  
University of Aberdeen, UK  
Lloyd’s Register Foundation (LRF), UK

10:20-10:40  Wireless Sensor Monitoring of Cathodic Protection Solutions  
Proserv, UK

10:40-11:00  Strain Estimation Using a Modal Expansion Approach Via Virtual Sensing for Structural Asset Management  
University of Strathclyde, UK

11:00-11:20  Dynamic Analysis of North Sea Jacket Foundations Under Severe Wave-in-Deck Loading  
Atkins, UK

11:20-11:40  Development of Non-Linear Stochastic Fatigue Crack Growth Models for Structural Grade Steel  
Shell, UK

11:40-12:00  Inspection and Life Extension of Ageing Pipe-in-Pipe Systems using Discovery™, the World’s Only Subsea CT Scanner  
Tracero, UK

12:00-12:20  Online Damage Detection Using Recursive Principal Component Analysis And Time Varying Auto Regressive Modeling  
Indian Institute of Technology, India  
University College Dublin, Ireland

12:30-13:30  LUNCH

13:30-13:50  Effect of debris impact on post-blast response of steel columns  
Dundee University, UK  
Atkins, UK

13:50-14:10  Modelling permanently installed health monitoring system for High Pressure-High Temperature (HPHT) subsea pipelines.  
University of Aberdeen, UK

14:10-14:30  On the Development of Tools for Value of Information Analyses  
DTU, Denmark

14:30-14:50  A grey-box model for wave force prediction  
Ramboll, Denmark  
University of Sheffield, UK

14:50-15:10  Data Driven model for Well Integrity management: case study for the Danish sector of North sea  
University & Danish Hydrocarbon Research and Technology Centre, Denmark

15:10-15:30  Non-Uniform Corrosion Prediction Of Stiffened Plates Due To Interactions With Mechanical Stress  
University of Southampton, UK

15:30-16:00  BREAK

16:00-16:20  Vector-Phase Analysis of Bearing Defect on the Base of Wave Health Monitoring (WHM)  
Advanced Vector Analytics, Latvia

16:20-16:40  Considerations For Monitoring of TLP and Tendon Parameters During Repair and Replacement of Key Components  
Ashtead Technology, UK

16:40-17:00  Application Of Machine Learning To Structural Integrity Monitoring Of Offshore Oil And Gas Platforms  
Fugro GB Marine Ltd, UK

17:00-17:20  Transience statistics for fatigue load assessment  
Wood, UK
Conference Venue & Conference Dinner Venue

The conference & the conference dinner will take place at the DoubleTree by Hilton Aberdeen Treetops, a quiet venue in the West End of the city, with close links to Aberdeen Airport, the Exhibition/Conference Centre (AECC) and the City Centre. The full address and website are: 161 Springfield Rd, Aberdeen , AB15 7AQ, Ph: 01224 313377, Click here for website.

About Aberdeen

Aberdeen is a thriving city – with people working and studying here from across the world, attracted as to Europe’s capital of energy (both O&G and renewables) and offshore and subsea industries with many of the main players and supply chain/services providers having a strong presence. The city itself is home to several museums including the Tolbooth Museum, Aberdeen Maritime Museum, Gordon Highlanders Museum and the Zoology Museum. Scotland’s first centre of science and discovery can also be found near Aberdeen Beach and there are a great selection of cultural attractions, with several theatres and art galleries across the city. Equally well-known for its shopping, the city’s Union Square (adjacent to Aberdeen Railway Station) has over 50 top shopping brand stores (including MAC, BOSS, Apple and ZARA), and 30 restaurants, as well as a 10-screen cinema. Nearby, the connecting Trinity Shopping Centre is home to a large Primark and Debenhams, and many other shops. Aberdeen’s rivers and the North Sea are also home to a host of wildlife, and even dolphins have found a home here. These fascinating mammals are regularly seen playing at the mouth of Aberdeen’s working harbour; Dolphin Watch, located at the vantage point of Torry Battery, is open seasonally to help visitors spot these urban dolphins. If you like you can also take on of Aberdeen Harbour Cruises, providing a great opportunity to experience a different viewpoint of the city as well as get up close to wildlife. Aberdeenshire is also home to a large number of traditional castles and outdoor activities. For those attendees that enjoy hiking and hillwalking, Aberdeen acts a great starting point for exploring the Cairngorms National Park.

Getting Here

Getting to Aberdeen is simple, with a whole variety of transport options available to those travelling, and the city can be reached by road, rail, or sky. Once in the city there are excellent transport links throughout the area meaning most destinations are easily accessible by public transport, taxi or car. For those driving, Aberdeen is approximately 2.5 hours’ drive from Edinburgh or Glasgow. Well sign-posted, the surrounding area of Aberdeenshire is within close proximity of Aberdeen with the towns and villages easy to get to by major country and main roads. For those flying, Aberdeen International Airport is located just six miles from Aberdeen city centre and is within easy reach of Aberdeenshire by bus or taxi. The region is well connected globally with daily flights to all major airports including all three London airports, Frankfurt, Paris and Amsterdam. The international airport also has many direct routes to most UK cities as well as many key European destinations. For more information you can visit Aberdeen Airports website HERE. Aberdeen’s railway station right in the heart of the city (next to the main shopping centre, Union Square), has frequent, fast and reliable services to and from all Scotland’s major cities. Travel on one of the hourly trains from Glasgow and Edinburgh or use the east coast line to travel from cities such as York or Newcastle. For timetables and to book your train tickets to Aberdeen visit the Scotrail website HERE. For those preferring to travel overnight, Aberdeen can also be reached from London on the Caledonian Sleeper. Visit the Caledonian Sleeper website HERE for more information about this service.

Accommodation

- Jurys Inn Aberdeen
- Hotel ibis Aberdeen Centre
- Travelodge Aberdeen Central
- Mercure Aberdeen Caledonian Hotel
- Aberdeen Douglas Hotel
- Hilton Garden Inn Aberdeen City Centre
- DoubleTree by Hilton Hotel Aberdeen Treetops
- Premier Inn Aberdeen City Centre

Special Delegate Rate - Doubletree by Hilton
£70 per night: Single with Breakfast
£80 per night: Double with Breakfast

QUOTE ‘STRUCTURAL INTEGRITY 2018 CONFERENCE BY ASRANET’