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Ultrasonic Peening Equipment

Ultrasonic Peening Equipment



LETS Global Heavy-Duty UP System with multi-striker in action





LETS Global Heavy-Duty Ultrasonic Peening System



LETS Global Ultrasonic Peening Tool



LETS Global Subsea Ultrasonic Peening Tool



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Ultrasonic Peening and Life Extension of Offshore Installations

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Singapore Seminar,
25 & 26 June 2014:
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LETS Global in the Offshore Marine
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LETS Global Heavy-Duty UP System with multi-striker in action





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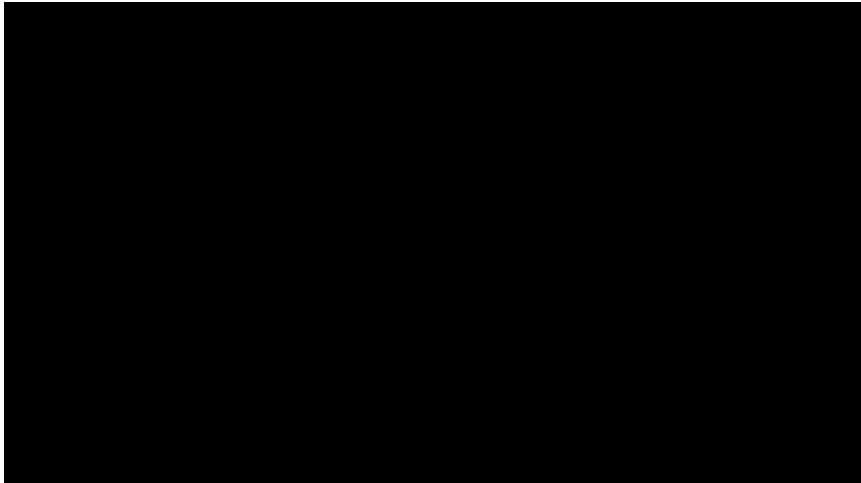
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Introduction



Life Extension of Offshore Installations intro



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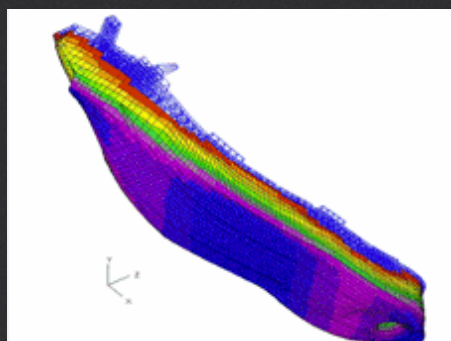


Services

LETS Global services

We contribute to maintain structural integrity and achieve the desired extension of offshore installations.

This is done by means of a comprehensive Life Extension Program approach where the structural integrity sensitive areas are selected and quantified with the help of FE analysis, offshore inspections and the experience of our skilled Naval Architects and Structural Integrity engineers.



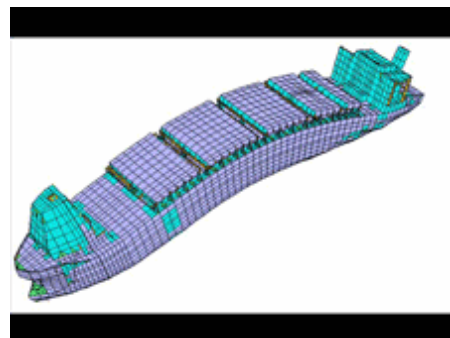
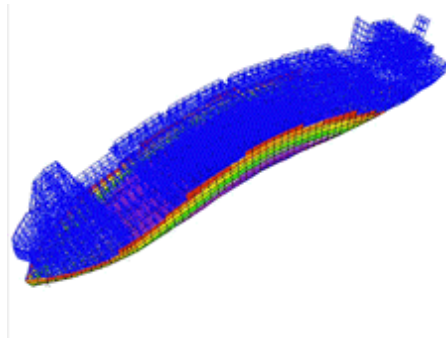
*FPSO hull FEA for life extension purposes
(Courtesy of Bureau Veritas)*

When the fatigue sensitive weld connections are located and the target service life selected, LETS Global Life Extension Procedure which includes ultrasonic peening treatment, will ensure a fatigue crack free structure for the remaining service life.

We provide advice on FEA model development including sub-modeling and results evaluation, onsite offshore inspection and ultrasonic peening treatment.

As most of the offshore installations







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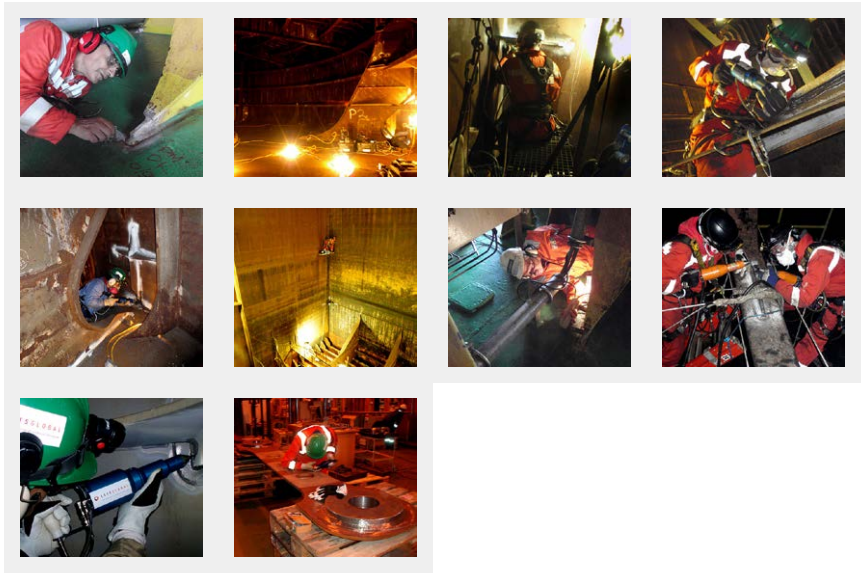
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Life extension of offshore platforms gall port



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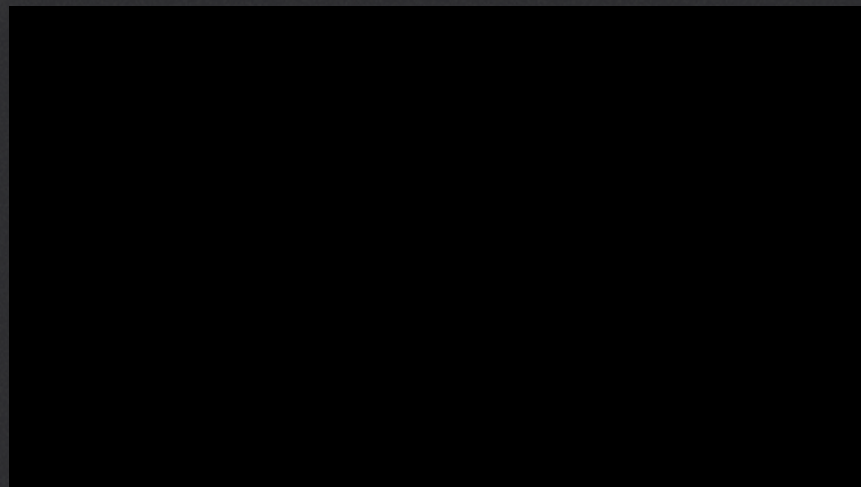
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News



Life extension news port



Life Extension Of Floating And Fixed Offshore Structures

Date: 25 & 26 June 2014

Venue: Singapore

Following-up our Structural Life Extension series from London, Rotterdam, Kuala Lumpur we are presenting our next seminar this time in Singapore.

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RESIDUAL STRESS MEASUREMENT IN AN ULTRASONIC PEENED SPECIMEN

Ficquet X. (Veqter Ltd.), Hedmar M. (LETS Global) and Kingston E. (Veqter Ltd).

Abstract



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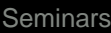
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NEXT Seminar:
Life Extension Of Floating And Fixed Offshore Structures
Singapore, 25 & 26 June 2014

[http://lets-global.com/seminars/\[25.05.2014 18:47:14\]](http://lets-global.com/seminars/[25.05.2014 18:47:14])



Structural Life Extension of Offshore Installations



INTRODUCTION
This course will give a fresh and practical insight in the new repair techniques and treatment can used and improvement methods to safeguard the structure integrity and extend the fatigue life of offshore installations without the use of hotworks.

By implementing the three pillar of the life extension concept, participants will see how Fatigue Assessment, Inspection and third improvement methods can be combined to enable new possibilities in the extension projects.

Participants will be shown how different life extension projects where used improvement methods were used to successfully extend the fatigue life of offshore installations.

The course participants will gain understanding in the benefits and drawbacks of the following used improvement methods: Ultrasonic Peening, Thermal Peening, Burn Grinding and TIG Dressing. Of these methods the most focus will be put on Ultrasonic Peening.

METHODOLOGY
The course will use a number of recent real life case studies and related exercises, drawing on the extensive experience of the course Director. 30 years of experience in marine fatigue and a specialist in the field of structural life extension of offshore installations is a unique offering. The case studies are designed to involve participants in an interactive manner and stimulate discussion of the key factors. Following training experiences amongst the participants. The case studies will be supplemented by power point presentations illustrating the case principles and providing participants with additional expertise. Participants will receive presentation material, including case studies.

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Who should be attending?

- Marine Technicians/Engineers
- Marine Corrosion/Engineers
- Integrity Manager/Engineers
- Project Offshore Installation Manager
- Superintendent of Maintenance
- Superintendent

Industries:

- FPSOs
- FPSOs
- FPSOs
- Offshore Support Vessels
- Offshore Support Vessels

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Structural Life Extension of Floating Offshore Installations

3 day training

Today operations are faced with the challenges of ageing offshore installations and the consequent fatigue lives of their structure details. As offshore of offshore installations are subject of increasing importance for the world with the growing demand for oil and gas, the need for the maintenance of these structures will be high. This course will help engineers and have access to these challenges.

Who should be attending?

Naval Architects/Engineers working with:

- Structural Integrity of Floating Installations

Work on:

- Marine Coordinator
- Design Manager/Engineer
- Project/Offshore Installation Manager
- Construction of Installations

Industries:

- Oil/Gas
- Offshore
- Offshore
- Offshore
- Offshore

Tutors Biographies

Luis Lopez Martinez
Luis Lopez Martinez is a Senior Engineer in the Offshore Division of the Spanish Navy. He has been working in the field of offshore structures for over 20 years. He is currently working as a Senior Engineer in the Offshore Division of the Spanish Navy. He is also a member of the Spanish Society of Naval Architects and Marine Engineers (IAIA).

Malcolm Redman
Malcolm Redman is a Senior Engineer in the Offshore Division of the Spanish Navy. He has been working in the field of offshore structures for over 20 years. He is currently working as a Senior Engineer in the Offshore Division of the Spanish Navy. He is also a member of the Spanish Society of Naval Architects and Marine Engineers (IAIA).

Course overview: What you will gain?

- This course will give a fresh and practical view to the way engineers can go about understanding the structural integrity of an offshore installation, without the use of software.
- By implementing the three pillars of the life extension concept, participants will learn how to use the life extension concept to improve the structural integrity of an offshore installation.
- Participants will learn how to use the life extension concept to improve the structural integrity of an offshore installation.
- Participants will learn how to use the life extension concept to improve the structural integrity of an offshore installation.

Methodology

The course will use a number of methods to help participants understand the life extension concept. This includes the use of case studies, practical exercises, and the use of software. The course will also include a number of practical exercises to help participants understand the life extension concept.

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Início

Impacto ultrassônico e extensão da vida útil de plataformas offshore

RESISTÊNCIA É NOSSO NEGÓCIO

Introdução



Serviços



Equipamentos Impacto
Ultrassônico



Galeria Trabalho



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Seminário em Cingapura:
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Life Extension Of Floating And
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LETS Global em a revista “Offshore
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Next Conference:

33rd International Conference on Ocean, Offshore and Arctic Engineering ,OMAE 2014 June 8-13, 2014, San Francisco, CA, USA

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RESIDUAL STRESS MEASUREMENT IN AN
ULTRASONIC PEENED SPECIMEN, Ficquet X. (Veqter

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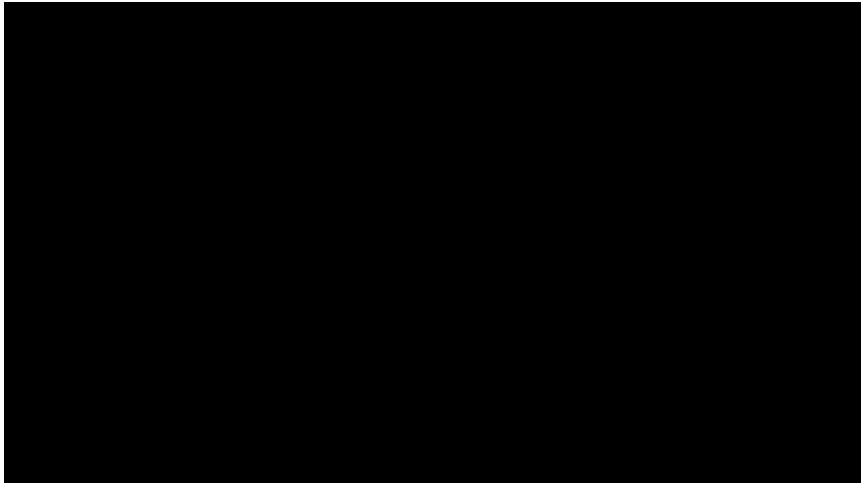
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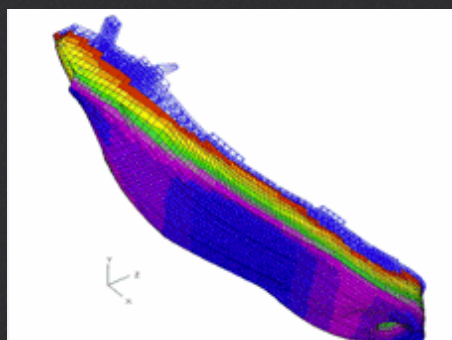


Serviços

Serviços

Nós contribuímos para manter a integridade estrutural e alcançar a extensão da vida alvo de instalações offshore.

Isto é feito através da aplicação de um Programa de Extensão da Vida, onde as áreas sensíveis para integridade estrutural são seleccionadas e quantificadas com a ajuda de análise FE, inspeções offshore e a experiência de nossos qualificados engenheiros navais e engenheiros em integridade estrutural.

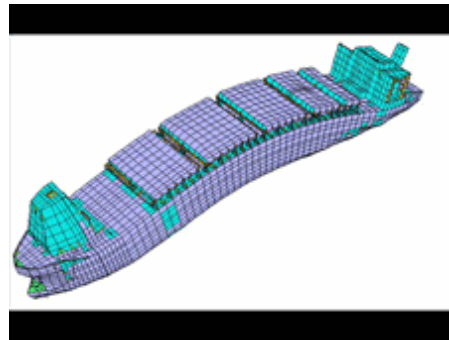
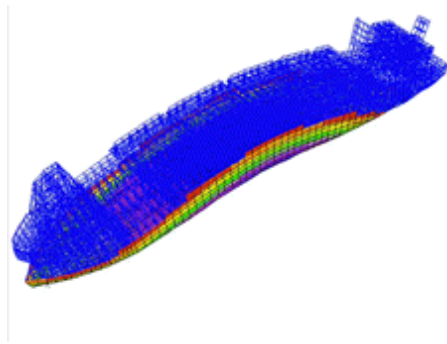


*FPSO hull FEA for life extension purposes
(Courtesy of Bureau Veritas)*

Quando as conexões de solda sensíveis para fadiga estão localizados ea vida de serviço de seleccionada, o Procedimento de Extensão da Vida da LETS Global, que inclui o tratamento por impacto ultrassônico, irá garantir uma estrutura livre de trincas de fadiga para a vida útil remanescente.

Prestamos assessoria no desenvolvimento do modelo elementos finitos, FEA, incluindo sub-modelagem e avaliação de resultados, inspeções offshore da estrutura e tratamento por impacto ultrassônico.





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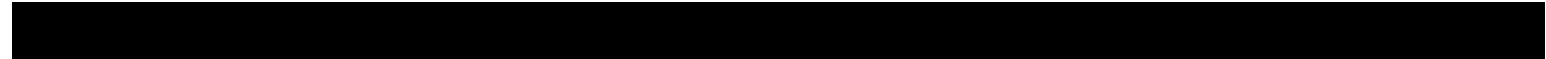
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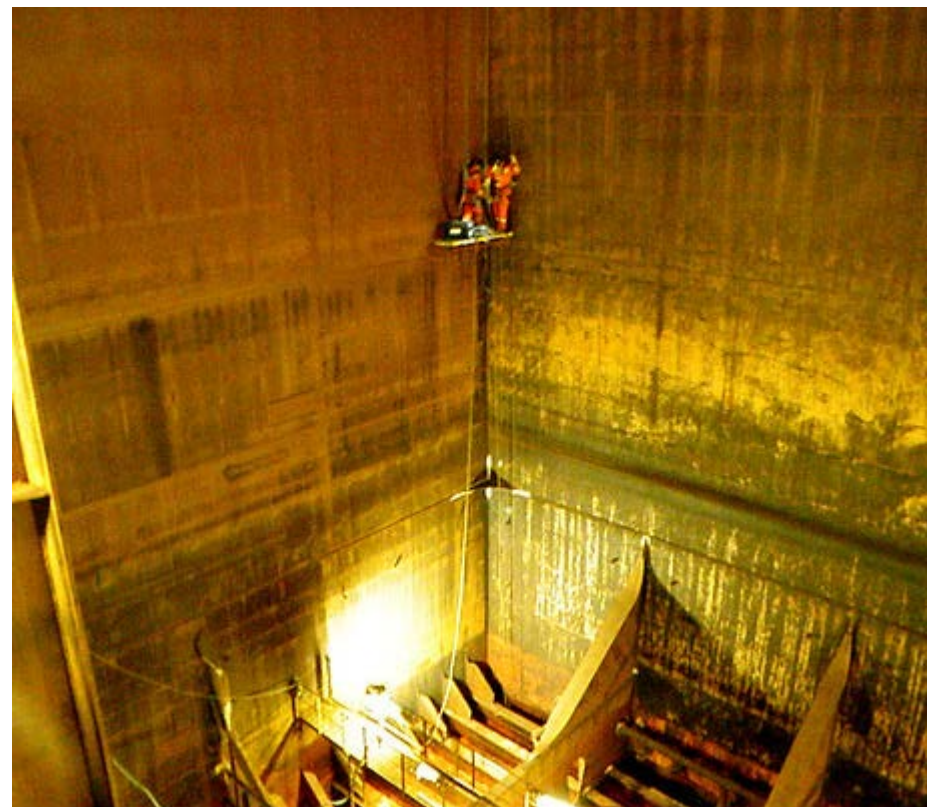


















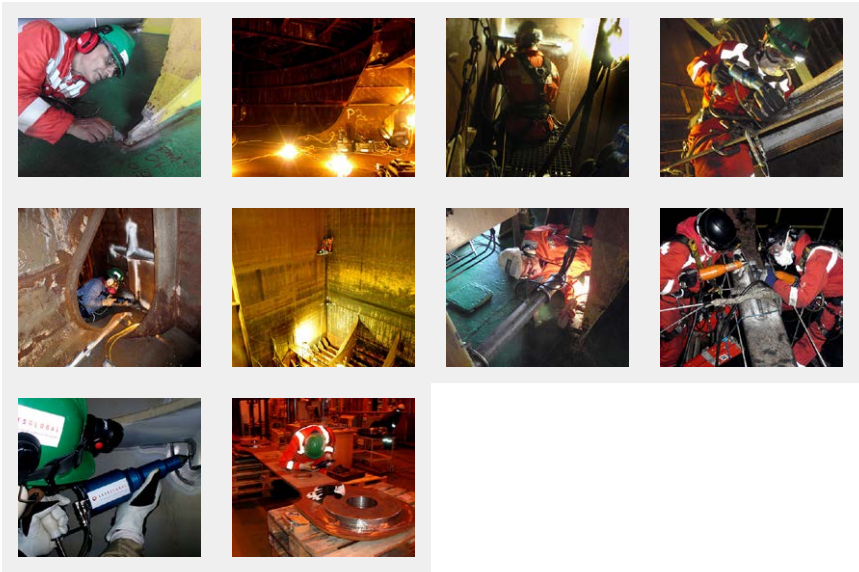


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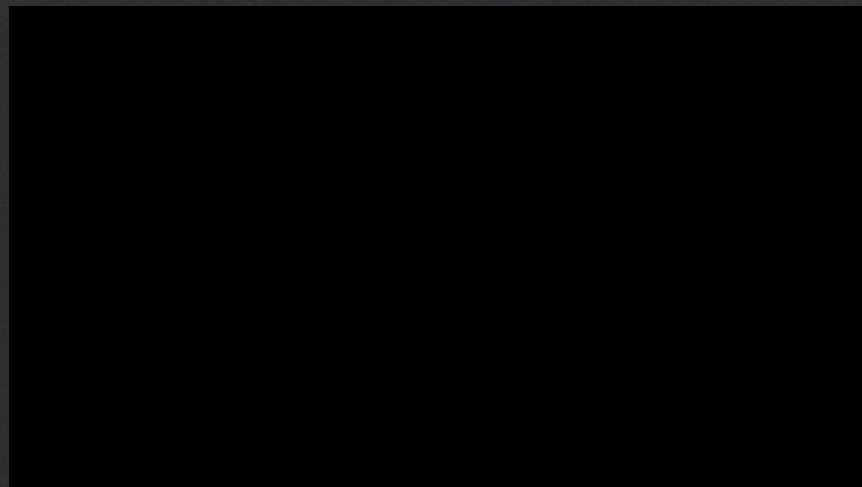
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Date: 25 & 26 June 2014

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RESIDUAL STRESS MEASUREMENT IN AN ULTRASONIC PEENED SPECIMEN

Ficquet X. (Veqter Ltd.), Hedmar M. (LETS Global) and Kingston E. (Veqter Ltd).

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OMAE2014-23374

RESIDUAL STRESS MEASUREMENT IN AN ULTRASONIC PEENED SPECIMEN

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Bristol, UK

Malcolm Hedmar
LETS Global
Rotterdam, The Netherlands

Ed J. Kingston
VEQTER Ltd.
Bristol, UK

ABSTRACT

Plastic deformation from peening induces a compressive residual stress on the treated surface which provides resistance to metal fatigue. Hence, peening is often used to extend the fatigue lives of welded components by reducing the effective tensile residual stress. This paper describes the influence of ultrasonic peening on the residual stress. For this study a four point plastically bent beam specimen, similar to the reeling process, was used. The specimen was made from 50D steel a material often used in offshore structural components. The residual stresses in the specimen were measured before ultrasonic peening with 5 different measurement techniques. After the ultrasonic peening treatment the residual stress was measured using the Incremental centre hole drilling and the ring core techniques. Measurements were carried within the homogeneously bent section location as well as outside. In order to see the variation of the results influenced by the gauge volume, strain gauges of three different sizes were used to provide results within 0.5mm, 1mm and 2mm depth. The measurements show that the ultrasonic peening surface treatment carried out induced high compressive residual stresses up to 2mm deep inside the specimen. Finally a compendium of residual stress profiles using different peening processes and materials is presented and discussed.

INTRODUCTION

During the last couple of years significant research has been done on the subject of ultrasonic peening [1]. This research has increased the awareness and understanding of the improved fatigue life ultrasonic peening can achieve when applied on welded components. Ultrasonic Peening (USP) has been widely used in the offshore industry to increase the fatigue life of welded components [2]. Previous research has shown that USP

can induce compressive residual stresses into material [2] and has therefore been used on the weld-face of fatigue hot-spots. Compressive residual stresses improve resistance to metal fatigue and to some type of corrosion, since cracks will not grow in a compressive environment. USP treatment of the weld face is especially applied on multi-pass welded components.

Until now the change in residual stresses at the surface of the component was not accurately documented. To gain a better understanding of the USP effect on residual stresses a program was initiated using a four point plastically bent beam type specimen. The resulting through thickness residual stress distribution has a typical “Z” shape with tension in one side and compression in the other side [3]. Measurements were made in the homogeneously bent section with zero shear force and a constant bending moment area using five different Residual Stress Measurement (RSM) techniques prior to the USP treatment to evaluate the stress field. After USP treatment measurements were carried out using the Incremental Centre Hole Drilling (ICHD) technique with different gauge sizes and the Ring Core (RC) technique. The measurements carried out after USP treatment showed high compressive residual stress at the surface of the bent beam. As the compressive residual stress exceeded the 80% of the yield strength the ICHD measurement have to be considered as indicative as they tend to overestimate the residual stress as suggested by the ASTM E837-13a [4]. In order to evaluate the incertitude of the presented ICHD measurement an estimation of the new yield strength after work hardening has been done using the hardness data.

Finally, a comparison using the residual stress database has been done using various peening techniques as well as different material types from previous research.

Ultrasonic peening: a life extender for FPSOs?

With structural fatigue posing a threat to active FPSOs, a cost- and time-efficient method is required for maintaining these vessels' integrity. Malcolm Hedmar, project manager and director of LETS Global do Brazil, presents the case for his company's ultrasonic peening methodology

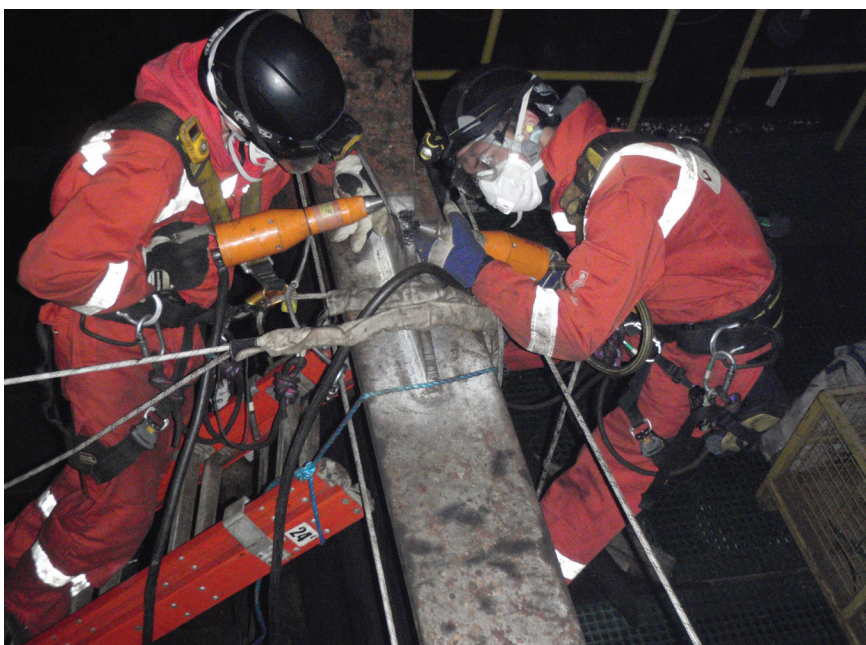
Life extension for offshore installations has become a popular topic, as it should be; one thing man cannot stop is time, and with time comes aging. More and more offshore installations are reaching the ends of their original design service lifespans. All rigs are designed for a certain amount of time out on the open sea, and with all the elements pitted against them; at a certain point, all rigs will start to show signs of fatigue.

The structural integrity of offshore installations is very important because without the body keeping the production equipment and oil afloat, there is not much of an installation to talk about. So, operators must ensure that the structural integrity of their aging rigs is kept intact, and safeguard it well – at any cost. This used to be an expensive process, not only because of the actual extra steel that had to be hauled onboard, plus the man hours necessary to put this steel into place, but mainly because of the hot work involved. The heat incurred by welding never did mix very well with oil. Subsequently, production frequently had to be halted and tanks had to be emptied before any work could take place. A lost profit is a loss, whichever way you look at it.

But with time comes progress, and the topic of this article is the technology that arose from that progress. It is referred to as the 'Life Extension Concept' and it is intended to help operators solve problems related to structural integrity.

Hammering out the faults

This concept is built around the possibility of considerably increasing welded joints' strength against fatigue. The technique, which has come to be known as ultrasonic peening, was originally invented in the Soviet Union, when it was applied to submarines during the Cold War.



Ultrasonic peening produces no heat, meaning it can be applied aboard oil- and gas-producing FPSOs with no disruption to operations, whilst the vessel is still at sea

Ultrasonic peening might sound similar to ultrasonic testing, which tends to mislead people into thinking that it is a type of inspection method. To break it down for the average reader, 'ultrasonic' refers to the utilised frequency, which happens to be in the ultrasonic spectrum which starts at 20KHz, and the verb 'peening' is derived from the hardened steel peen which works the steel surface.

So, when performing ultrasonic peening, a hardened steel peen is oscillated, or hammered, against a weld-toe or steel surface at approximately 20,000 times per second, with an amplitude of only 0.05mm. As the peen hammers the weld toe, a couple of things happen; first of all, all non-geometrical features and crack-like flaws are removed, leaving a smooth groove with a diameter

of > 4mm. As the peen's amplitude is small, the created groove consists of a compressive layer that has high resistance against fatigue cracking.

Numerous projects have been carried out in collaboration with DNV, the International Institute of Welding (IIW), Sweden's SSAB, the Norwegian University of Science and Technology (NTNU) and the Royal Institute of Technology, Sweden (KTH), among others, in order to measure the benefit of the LETS Global Ultrasonic Peening Procedure on offshore installations.

The benefit that this procedure has on a given welded joint on an offshore installation is largely dependent on the stress range that the component is under. Therefore, it is actually difficult to give a constant regarding how much



of a difference the treatment will make. However, as a rule of thumb, the fatigue life of a welded attachment on an offshore installation, under high cycle fatigue with stresses of 200MPa, will be increased fivefold.

Previously, when fatigue hotspots were located and classed as a threat to the structural integrity of the installation, the common approach was to start to add steel, in order to reinforce the specific area. The downside of this approach is that you end up changing the stiffness of the vessel in one specific area, making nearby areas prone to the development of more fatigue hotspots.

The ideal solution is to strengthen the area of concern without altering its stiffness, keeping the dynamics of the vessel the same. This is one of the reasons why ultrasonic peening is becoming viewed as an ideal solution for integrity challenges deriving from high cycle fatigue.

The procedure will only be significantly beneficial if the welded joints selected for treatment are of full or almost full penetration. As only the surface of a weld can be treated, the root of the weld is left untouched, demoting it to become the 'Achilles heel' in the operation. This is because, even if the weld toe and surface are greatly strengthened, the crack initiation can still take place at the root of the weld, limiting the possible gain in fatigue life.

FPSO applications

As you might expect, ultrasonic peening can be applied to any structure suffering from structural fatigue. However, FPSO operators in particular are finding the concept appealing.

The first reason for this is the fact that FPSO operators want to avoid any cessation in production aboard their assets, as well as any subsequent drydocking for structural repairs, so naturally they are keen to do their utmost to avoid this scenario. Secondly, and related to the first reason, the contracts that FPSOs tend to enter are relatively long compared to, say, those for drilling rigs, so the majority of FPSO structural maintenance jobs must be conducted whilst the vessel is out at sea.

Another advantage for this vessel sector is that the ultrasonic peening procedure does not produce any heat when performed, so it is a relatively easy procedure to perform aboard an oil- and gas-producing FPSO.

During Q3 2012, Brazilian oil major Petrobras put its first FPSO through a life extension project involving the use of ultrasonic peening. Petrobras realises that, in order to reach the production goal it has set for 2020, it needs to safeguard the structural integrity of its existing fleet of production platforms; downtime caused by unforeseen structural failures will greatly jeopardise this goal.

The first phase of the project was identical to that of the then HESS-owned FPSO *Triton*, namely the application of ultrasonic peening to fatigue hotspots located near the FPSO's pallet stools. The production deck that rests on the pallet stools is much stiffer than the less rigid FPSO hulls, so, as the hull moves with the sea, the pallet stools, supporting the stiff production deck, will experience immense stresses against the vessel's deck, often leading to fatigue cracks.

As the project commenced, signs of structural fatigue were already evident, with 23 pallet stools showing the first signs of fatigue cracks. In total, 30 pallet stool fatigue hotspots were treated with ultrasonic peening, in many cases removing shallow cracks from the deck. At some specific locations, the fatigue cracks were too developed, hindering the possibility of successfully extending lifespan with ultrasonic peening alone; in a scenario like this, weld repair is the only viable solution.

Triton was ahead of the game, having had the ultrasonic peening procedure applied to her pallet stools back in 2005/2006. However, as this vessel's service lifespan is scheduled to continue until 2022, a more comprehensive life extension programme has been put into place.

In total, eight of *Triton*'s ballast tanks will undergo ultrasonic peening, treating a total of 640 fatigue hotspots. The aim of the project is to avoid fatigue cracks developing in the water ballast tanks in the future. The life extension ballast tank project was initiated in 2008 and remains

ongoing. The underlying aim is still to treat all fatigue hotspots without a single interruption of production.

Identical issues

So, is it necessary to use ultrasonic peening after a conventional weld repair? At LETS Global do Brazil, we would have to answer: "Yes". In addition to the results of the aforementioned case studies, there is the fact that, with conventional weld repair, you will only get to restore 'what once was', which means that the relatively high stresses will still remain and the material will be unchanged; the only thing that will have changed will be the considerable increase of harmful residual stresses in the heat-affected zone (HAZ). All of these factors combined mean that the crack will re-initiate sooner rather than later if ultrasonic peening is not applied.

Engineers tasked with maintaining the structural integrity of FPSOs often seem to work in a state of relative isolation from their counterparts at other companies. FPSOs, and especially FPSOs originating from conversions, all tend to encounter the same structural problems.

To some extent, it is understandable that operators do not want the shortcomings of their rigs to become known to all. However, by disclosing this information, the industry as a whole can work together to cut downtime and costs, as it is very likely that the neighbouring rig is facing the same problem, or has maybe even just recently solved the same problem your rig or FPSO is facing.

We are now entering an era where FPSOs are no longer viewed as a new phenomenon. Today, there are FPSOs whose fatigue life is close to an end, but headstrong operators are keen to do everything in their power to keep them producing in a safe manner. Much can be learned from these stalwart rigs, as it becomes increasingly obvious how much time and money can be saved if a more proactive approach towards structural integrity is taken.

To this date, four offshore installations have undergone life extension with ultrasonic peening. It is just a matter of time before that number also increases fivefold. **OMT**

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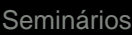
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- Integrity Manager/ Engineer
- Project Offshore Installation Manager
- Superintendent of Maintenance
- Superintendent

Industries

- FPSOs
- FPSs
- FPSOs
- FPSs
- FPSOs
- FPSs

Structural Life Extension of Offshore Installations



INTRODUCTION

This course will give a fresh and practical insight into the new repair techniques and equipment that can be used to improve methods to safeguard the structural integrity and extend the fatigue life of offshore installations without the use of hotworks.

By implementing the three pillars of the life extension concept, participants will see how Fatigue Assessment, Inspection and Repair Improvement Methods can be combined to enable new approaches in the extension projects.

Participants will be shown how different life extension projects where repair improvement methods were used to successfully extend the fatigue life of offshore installations.

The course participants will gain understanding in the benefits and drawbacks of the following repair improvement methods: Ultrasonic Peening, Impact Peening, Burn Grinding and TIG Dressing. Of these methods the most focus will be put on Ultrasonic Peening.

METHODOLOGY

The course will use a number of topics that will be case studies and related exercises, drawing on the extensive experience of the course Director. 30 years of experience in marine fatigue and a director in the field of structural life extension of offshore installations to offshore drilling. The case studies are designed to involve participants in an interactive manner and stimulate discussion of the key issues. Following training experiences amongst the participants. The case studies will be supplemented by power point presentations illustrating the case principles and providing participants with additional expertise. Participants will receive presentation material, including case studies.

Training
May 2013

For more information or to register for the event, please contact us on +60 3 202 271 1000
Email: info@lets-global.com and visit our website: www.lets-global.com

<http://lets-global.com/pt-pt/seminarios/>[25.05.2014 18:48:43]



Structural Life Extension of Floating Offshore Installations

3 day training

Today operations are faced with the challenges of ageing offshore installations and the consequent fatigue decay of their structure details. As offshore of offshore installations are subject of increasing importance for the world with the growing demand for the supply of energy in the remote areas of the world. This course will help engineers and have answers to these challenges.

Who should be attending?

Naval Architects/Engineers working with:

- Structural Integrity of Floating Installations

Work on:

- Marine Coordinator
- Design Manager/Engineer
- Project/Offshore Installation Manager
- Construction of Installations

Industries:

- Oil/Gas
- Offshore
- Offshore
- Offshore
- Offshore

Course overview: What you will gain?

- This course will give a fresh and practical view to the way engineers can go about understanding the structural integrity of an offshore installation, without the use of software.
- By implementing the three pillars of the life extension concept, participants will learn how to use the life extension concept, and how to use the life extension concept to extend the life of an offshore installation.
- Participants will learn how to identify, assess, and manage the structural integrity of an offshore installation, and how to use the life extension concept to extend the life of an offshore installation.
- The course participants will gain understanding in which areas to look when looking structural fatigue problems and how to use the life extension concept to extend the life of an offshore installation.

Methodology

The course will use a number of recent case studies and modern software, drawing on the extensive global experience of the Course Director's 30 years of experience in marine fatigue and as a partner in the field of offshore life extension of offshore installations. These case studies and software are designed to ensure participants have a practical understanding of the life extension concept, and how to use the life extension concept to extend the life of an offshore installation.

Tutors Biographies

Luis Lopez Martinez

Luis Lopez Martinez is a Senior Engineer in the Marine Department of the Spanish Navy, and has been working in the field of offshore life extension of offshore installations for over 20 years. He is currently working as a Senior Engineer in the Marine Department of the Spanish Navy, and has been working in the field of offshore life extension of offshore installations for over 20 years.

Melvin Winkler

Melvin Winkler is a Senior Engineer in the Marine Department of the Spanish Navy, and has been working in the field of offshore life extension of offshore installations for over 20 years. He is currently working as a Senior Engineer in the Marine Department of the Spanish Navy, and has been working in the field of offshore life extension of offshore installations for over 20 years.

Date : 29th, 30th & 31st Jan 2013

Venue : Rotterdam, The Netherlands



FPSO Training Series: Structural Life Extension of Floating Offshore Structures

20th & 21st June 2015, London, UK

Structural Life Extension of Floating Offshore Structures

Today operations are faced with the challenges of ageing offshore installations and the consequent fatigue lives of their structural steel. As methods of offshore installations are renewed or extended, engineers are required to extend the fatigue life of assets for a time period it was once not intended for.

COURSE OVERVIEW: WHAT WILL YOU GAIN?

This course will give a brief and practical view to the way engineers go about doing structural fatigue related to floating offshore installations to extend the fatigue life. Participants will learn how to accurately assess their existing current situations and how to extend a suitable extension in order to achieve the required life extension.

The course participants will gain understanding in which steps to take when taking structural fatigue matters and how to accurately calculate the structural integrity of the installation through a practical case study approach. This is done for the representatives of the industry today.

Participants will learn what measures are most cost effective when assessing different methods of structure life extension.

WHO SHOULD BE ATTENDING?

JOB TITLES

Have Architects/Engineers working with Structural Integrity of Floating Installations such as:

- Marine Superintendent
- Project Manager/Engineer
- Project Offshore Installation Manager
- Superintendent of Maintenance
- Superintendent

INDUSTRIES

- FPSOs
- FPSOs
- FPSOs
- FPSOs
- FPSOs
- FPSOs

METHODOLOGY

The course will use a number of recent 'real life' case studies and related exercises, drawing on the extensive global experience of the Course Director's 20 years of experience in offshore fatigue and as a pioneer in the field of structural life extension of offshore installations. These case studies and exercises are designed to involve participants in an interactive manner and encourage discussion of the key issues, including sharing of experiences amongst the participants.

The case studies and exercises will be supplemented by power point presentations including key observations and providing participants with additional resources. Participants will receive copies of all presentation material, including case studies and lecture notes during the course in both hard and soft copy forms for their reference.

For more information or to register for this extension event, contact JAC at jac@lets-global.com or [+442030000000](tel:+442030000000).

Training: lets-global.com

COURSE TOPICS

1. Introduction to the field of structural life extension of offshore installations, including the importance of structural integrity and the role of fatigue in the design and construction of offshore installations.

2. The importance of structural integrity in the design and construction of offshore installations, including the role of fatigue in the design and construction of offshore installations.

3. The importance of structural integrity in the design and construction of offshore installations, including the role of fatigue in the design and construction of offshore installations.

4. The importance of structural integrity in the design and construction of offshore installations, including the role of fatigue in the design and construction of offshore installations.

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9. The importance of structural integrity in the design and construction of offshore installations, including the role of fatigue in the design and construction of offshore installations.

10. The importance of structural integrity in the design and construction of offshore installations, including the role of fatigue in the design and construction of offshore installations.



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Contact

info@lets-global.com

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26th & 27th June 2012, London, UK



Structural Life Extension of Floating Offshore Structures

Today operators are faced with the challenges of ageing offshore installations and the consumed fatigue lives of their structural details. As contracts of offshore installations are renewed or extended, engineers are required to extend the fatigue life of assets for a time period it was once not intended for.

COURSE OVERVIEW: WHAT WILL YOU GAIN?

This course will give a fresh and practical input to the way engineers go about solving structural fatigue issues on floating offshore installations to extend the fatigue life. Participants will learn how to accurately assess their vessels' current situations and how to produce a qualified action plan in order to achieve the required life extension.

The course participants will gain understanding in which steps to take when tackling structural fatigue problems and learn how to accurately safeguard the structural integrity of their installations through a proactive risk based approach model as used by the forerunners of the industry today.

Participants will learn what measures are most cost effective when assessing different methods of structural life extension.

WHO SHOULD BE ATTENDING?

Job titles

Naval Architects/Engineers working with Structural Integrity of floating installations such as:

- Marine Co-ordinator
- Integrity Manager Engineer
- Project Offshore Installation Manager
- Section/Head of Maintenance
- Superintendent

Industries

- FPSOs
- FSOs
- FPU's
- Semi submersibles
- Drill Ships
- Shipyards

METHODOLOGY

The course will use a number of recent "real life" core case studies and related exercises, drawing on the extensive global experience of the Course Director's 30 years of experience in material fatigue and as a pioneer in the field of structural life extension of offshore installations. These case studies and exercises are designed to involve participants in an interactive manner and stimulate discussion of the key issues, including sharing of experiences amongst the participants.

The case studies and exercises will be supplemented by power point presentations illustrating key data/principles and providing participants with additional examples. Participants will receive copies of all presentation material, including case studies and toolkit used during the course in both hard and soft copy forms for future reference.

COURSE TUTORS:

Luis Lopez Martinez

With 30 years of experience in material fatigue Luis Lopez Martinez has been speaking at OTC (2010, 2011), OMAE (Rotterdam and Brazil) and IIW (1998, 2007, 2012). As a Technical Director for LETS Global, the company are pioneers in structural life extension by Ultrasonic Peening. The company, with the help of Luis, have developed the procedures and equipments needed to tackle the structural issues operators are facing today with ageing offshore installations. The methodology has been coined The Life Extension Concept and is implemented in the North Sea, the Gulf of Mexico and Brazilian offshore sector by leading organisations such as HESS, BP and Petrobras.

Malcolm Hedmar

Malcolm Hedmar graduated as a Maritime Officer from the Maritime University of Applied Science in Rotterdam, the Netherlands, and currently holds the position as Ultrasonic Peening Quality Assurance and Quality Control Manager at LETS Global. With 7 years of offshore experience Malcolm is in charge of the in situ life extension work performed at rigs in the North Sea, Gulf of Mexico and Brazilian offshore sector.

For more information or to register for this exclusive event, contact ACI

By calling +44 (0) 207 981 2503

Emailing: cwilliams@acieu.net

FPSO Training Series: Structural Life Extension of Floating Offshore Structures



26th & 27th June 2012, London, UK



DAY ONE: 26th June 2012

08.30 Registration and Coffee

09.00 Module 1 - Introduction to Structural Life Extension

The introduction will briefly cover the three pillars of the Life Extension Concept, Fatigue Assessment, Inspection and Weld-Improvement method. We will then look at how the concept is changing the way operators go about addressing future fatigue problems. We will compare it with other measures at hand such as hot work replacement to understand when it is appropriate to do what. Participants will learn why the Life Extension Concept is cost effective enough for operators to start to move away from a reactive approach to proactively safeguarding structural integrity.

10.30 Morning Refreshments

11.00 Module 1 Continues

12.30 Lunch

13.30 Module 2 - Fatigue Assessment

In Fatigue Assessment, we learn how to locate and evaluate fatigue hotspots with the risk based approach used by the industry today. Participants will learn how to interpret Finite Element (FE) Models and assess their accuracy by relating the theoretics of a model to the real structure, taking corrosion and weld quality into account. Examples will be presented to give participants confidence in assessing and using produced FE models. On the basis of FE models and shown examples participants will learn how to go about when producing risk based approach matrices. In such matrices the participants will learn how to assess the consequences of cracks in different sections of the installation, the selected hotspots, and address them with the appropriate measures covered in the introduction.

15.00 Afternoon Refreshments

15.30 Module 2 Continues

17.00 End of Day One

DAY TWO: 27th June 2012

08.30 Registration and Coffee

09.00 Module 3 – Inspection

The Inspection module will cover the areas access to concerned areas, how to judge weld quality and actions to be taken if fatigue cracks are encountered. Participants will understand how to take access into account, including working on height with rope access or scaffolding and working in confined spaces. Participants will learn how the weld quality affects the fatigue life and the influence it has on weld improvement methods.

10.30 Morning Refreshments

11.00 Module 3 Continues

12.30 Lunch

13.30 Module 4 - Weld Improvement Method

With the combined knowledge of relating FE models to practice and inspection participants will learn what weld improvement method will be most suitable for achieving the fatigue life extension required. By looking at different weld improvement methods such as Ultrasonic Peening and Burr Grinding, where to apply these, the benefits and drawbacks the participants will gain understanding of the procedures and the possibilities they enable. Participants will leave the course with a thorough understanding of what preventive actions they can take in order to achieve the required life extension of their offshore installations.

15.00 Afternoon Refreshments

15.30 Module 4 Continues

17.00 End of Training

FPSO Training Series: Structural Life Extension of Floating Offshore Structures



26th & 27th June 2012, London, UK



5 EASY WAYS TO REGISTER

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Fax: +44 20 7593 0071
Email: cwilliams@acieu.net

Web: <http://www.acius.net>
Mail: ACI Europe, 5/13 Great Suffolk Street, London, SE1 0NS

TERMS AND CONDITIONS

How to Register

Registrations must be received in writing or electronically at our secure web site. Please complete and mail or fax a copy of registration form with a cheque or credit card number. Fee includes program materials, continental breakfast, networking luncheon and refreshments.

Payment

Payment must be received within five business days of returning the signed contract. After receiving payment a VAT receipt will be issued. If you do not receive a letter outlining details two weeks prior to the event, please contact the Conference Co-ordinator at ACI Europe Ltd.

Discounts are available for multiple/group bookings. Please call +44 (0) 207 981 2503 for more information

Cancellations

Substitutions are welcome up to 24 hours prior to the event. Cancellations must be received in writing no less than 3 weeks prior to the start of the conference; a full credit voucher towards a future ACI conference will be issued. Any cancellation received less than 3 weeks prior to the start of the event shall be deemed to be a breach of this contract by client, and accordingly, no credits will be given. Cancellations must be received in writing by mail or fax three weeks before the conference. Thereafter the full conference fee is payable. If for any reason ACI Europe Ltd decides to amend, cancel or postpone this conference, the conference fee will not be refunded. Furthermore, ACI Europe Ltd will not be responsible for covering airfare, hotel or other costs incurred by registrants. In the event that ACI Europe Ltd cancel or postpone the event, ACI Europe Ltd reserves the right to transfer this booking to another conference to be held in the following twelve months, or to provide a credit of an equivalent amount to another conference within the following twelve months. The construction, validity and performance of this agreement shall be governed in all respects by the laws of England to the exclusive jurisdiction of whose courts the Parties hereby agree to submit.

About ACI

ACI, a UK owned company, have been running successful conferences for the last 15 years in the USA. Headquartered in Chicago with offices all around the States, they run forums in varied fields and are market leaders in Healthcare business conferences. Opening their European head office at the end of 2005, they have expanded rapidly and are launching a series of events covering the maritime industry, energy, oil and gas industries.

Venue:

Central London, UK. Details to be confirmed.

The cost of accommodation is not included in the event fee. Preferential rates will be arranged with or near the event venue, and all confirmed delegates will be given details of how to book accommodation at this rate in due course.

Prices and Payment Information

Conference (Includes Documentation Packet)
Documentation Packet

DATES OF CONFERENCE
Copies of all conference proceedings

£1,995 (+ VAT)
£420

Documentation Packet Available

You can purchase the **FPSO Training Series: Structural Life Extension of Floating Offshore Structures** papers at just £420. Simply tick the box on the booking form, send it with payment and your copy will be on its way to you after the meeting. This important manual will be a source of invaluable reference for the future.

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OMAE 2015



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