Well integrity lifecycle management is a requirement for all wells, in order to have the license to operate, especially in environmentally critical areas. It is a multi-disciplinary effort that has several stakeholders, phases of application and is an endeavour that requires diligent planning throughout the phases of field development. Well integrity is often managed as part of the asset’s lifecycle production and maintenance.

Maintaining well integrity during the well operational phase requires the practice of proactive pressure monitoring programmes, barrier verification, and maintenance programmes. Programme performance standards and test acceptance criteria are defined during the well design phase and in conjunction with any applicable regulations.

In many cases, the end of well life may be extended past the original design life. Therefore, it is important to recognise that performance standards, acceptance criteria and required barrier testing and maintenance can change during the well lifecycle. When pressure, performance, or barrier compliance acceptance criteria do not meet the pre-defined standards for additional diagnostic tests, other mitigations such as well intervention and repairs, may be required.

With ageing wells and changing failure mechanisms, the challenge is to understand failure and consequences to a level that the process of managing well integrity is well understood and managed in a sustainable way.

This workshop has been designed to maximise opportunities for networking, knowledge sharing and learning. The event will concentrate on well integrity with a deeper review of the design, diagnostics, repair, risk assessment, management and mitigation, and lessons learnt and P&A.

### Session Highlights

| Asset Lifecycle Extension | Cost Effective Standards and Regulations | Digital Technologies and Solutions for Complete Well Lifecycle | Well Integrity and System Design – Lead by Design, not by Default |

| Well Integrity during Well Abandonment | Well Integrity during Well Construction | Well Integrity during Well Production |

### Technical Programme Committee

**CHAIRPERSONS**

- Muhammad Idham Khalid
  Head, Workover & Coiled Tubing Drilling (CTD), Wells Integrity & Workover
  PETRONAS Carigali Sdn Bhd

**COMMITTEE MEMBERS**

- Sathish Kumar Batumelai
  Regional Manager (Wireline Asia)
  Archer Well Company (M) Sdn Bhd

- Arthur Sam
  Chief Executive Officer
  Daya Maxflo Sdn Bhd

- Celeste Lee
  Completions & Well Intervention Engineer
  Kebabangan Petroleum Operating Company Sdn Bhd

- Junnyarun Barat
  Well Integrity Engineer
  PETRONAS

- Paul Bezant
  Principal Well Engineer
  PETRONAS

- Siti Najmi Farhan binti Zulkipli
  Staff Petrophysics
  PETRONAS Carigali Sdn Bhd

- Ramy Eid
  Drilling & Completions Manager - Technology
  REPSOL

- Dato’ Wan Hassan Mohd Jamil
  Chief Executive Officer
  Reservoir Link Sdn Bhd

- Johannes Klein
  Advisor WH and XT systems
  Ridge AS

- Suresh Murugiah
  Well Integrity Manager
  SGS Malaysia

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  Managing Director
  TÜV Rheinland Sonovation

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  Uzma Engineering Sdn Bhd

- Charles Bonaventure
  Director
  Weatherford

- Steven Allan Canny
  Intervention and Well Abandonment Specialist
  Weatherford

- Tore Fjågesund
  Managing Director
  Wellbarrier

- Andrew Spowage
  Engineering Manager
  Wood

**GROUP REGISTRATIONS AVAILABLE!**

Contact us at speki@spe.org to arrange your group.

www.spe.org/go/19WM07
MONDAY, 8 OCTOBER 2018

0800 – 0825 Arrival of Delegates and Registration

0825 – 0930 Safety Announcement by Hotel

0900 – 0930 Session 1: Welcome and Introduction
Chair: Muhammad Idham Khalid, PETRONAS

0915 – 0945 Group Photo and Morning Coffee Break

0945 – 1145 Session 2: Panel Session – Cost Effective Standards and Regulations
Session Managers: Sathish Kumar Batumelai, Archer Well Company (M) Sdn Bhd; Fred Gabriëls, TÜV Rheinland Sonovation

Since the occurrence of such incidents as Montara, Macondo and Elgin Franklin in the industry, there has been a re-evaluation of the standards and regulations utilised by well operators. Both updates and changes have occurred in standards as formulated, as formulated by industry bodies, and governmental regulators. These changes are, in turn, affecting how well integrity and its management are undertaken by well operators. This session covers the application of available standards and regulations throughout the lifecycle of a well in a cost effective manner. Regulations for drilling, well completion, as well as well integrity during production, wastewater discharges from field exploration and well abandonment procedures are influencing the way of operating an offshore well. During this session, insights into the different aspects of standards and regulations to well operations will be explored. This will be followed by a general discussion as to whether these measures are adequate.

1145 – 1245 Networking Luncheon

1245 – 1445 Session 3: Well Integrity and System Design – Lead by Design, not by Default
Session Managers: Siti Najmi Farhan Zukkipi, PETRONAS Carigali Sdn Bhd; Tore Fjøgesund, Wellbarrier

This session will focus on maximising value out of the well through an integrated value chain, starting from understanding the subsurface overview, conceptual well design, risk management, well control and barriers, monitoring program and action plans. The aim is to strive for the right data for the right application, holistic well design, early intervention, and mitigation in each stage of the well life. Wellbore isolation and minimising behind casing flow through the understanding of rock mechanics in the overburden or shallow hydrocarbon zones, cementing innovation and best practices need to be highlighted. An innovative cement recipe will not only prolong the well life, but it also promotes barrier assurance before failure creeps in. Managing risk in terms of identifying, capturing, predicting and mitigating the aspect in each of the elements in the value chain as well as in the wellbore will be a step-change to looking at the well and system holistically. The design basis must be safe to operate, reliable and enabled for future intervention to maximise well potential.

1445 – 1500 Afternoon Coffee Break

1500 – 1700 Session 4: Well Integrity during Well Construction
Session Managers: Celeste Lee, Kebabangan Petroleum Operating Company Sdn Bhd; Ramy Eid, REPSOL

Constructing effective well barrier is always one of the most important goals in well construction to avoid remedial work or workover later. Adding or modifying well barriers after a well is completed due to casing shoe fracture, poor cement isolation, and underground blowout are cumbersome and very costly. At various stages in the well construction phase, verification and monitoring integrity of well barriers are vital to preventing well control issues. Verification methods, acceptance criteria and issues of monitoring will be discussed in this session. The barrier in annulus, cement, is essential to achieve zonal isolation which can prevent sustained casing pressure and annular flow. Cement placement in wells with narrow pore and fracture pressure window is challenging and Managed Pressure Cementing (MPC) helps to maintain wellbore stability and control formation pressures. The session will present MPC design, modeling, and its challenges of implementation. After cementing, Cement Bond Logs (CBL) and Cement Evaluation Logs are usually conducted in the attempt to evaluate the effectiveness of cement bond to both pipe and formation. CBL interpretation is controversial as contradictory results could be generated depending on the input parameters. Hence, it is important to understand the challenges of CBL interpretation and best practices during CBL run for better data quality.

Topics of discussion will include:
- Well barriers verification and monitoring
- Cement bond log and cement evaluation logs issue
- Managed pressure cementing

1700 – 1900 Session 5: Well Integrity during Well Production
Session Managers: Arthur Sam, Daya Maxflo Sdn Bhd; Junyayarin Barot, PETRONAS

Producing oil and gas from a well is a complex activity. The intervention/workover and abandonment phases would likewise be approached. The industry promotes ‘lower-for-longer’ mode, and it is crucial that both fewer leaks and less damage to the environment, which leads to profits for their operation. In addition, with effective asset integrity, the export ecosystem.

The ongoing P&A activities on selected assets must also ensure adequate degradation mechanisms of system components and the risks associated with the asset. This will, therefore, be discussed. The challenges of single and dual reservoir abandonment phase. The potential for annular well barrier failures will be quantified from a risk and guideline perspective.

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The importance of effective well integrity management and strategies during well production increases as the asset continues to age. If operators maintain the integrity of their assets, they will have smooth operations and few interruptions which translate to more output and profits for their operations. In addition, with effective asset integrity management, operators will have safer operations with less accident, fewer leaks and less damage to the environment, which leads to enhanced reputation and integrity of their organisation.

The industry promotes ‘lower-for-longer’ mode, and it is crucial that both operators and contractors work together towards a reliable solution from both a cost and implementation viewpoint. During the production stage, challenges such as well subsidence issues, cement integrity, multi-layer casing and coring, are common and yet, the solutions are still elusive. As such, this session looks to further expound on the earlier sessions by way of discussion on region-specific case studies, best practices and lessons learnt. The case studies will highlight various solutions and challenges to assist operators on the following points of interest:

- Risk-based approach for well barrier verifications and remediation
- Collapsing wells and subsidence issues
- Sustained annulus pressure and corrosion management
- Cement integrity issues
- Region-specific case studies

Session 4: Well Integrity during Well Construction

Fred Gabriëls, PETRONAS

The ageing of offshore infrastructure presents a constant growing challenge for operators, as many oil and gas fields and installations are being operated beyond their original design life. Formal assessments are required to demonstrate sufficient technical, operational and organisational integrity to continue safe operation throughout the life extension phase. In this process, detailed information on structures, systems and components need to be assessed on historical and current data including future predictions. Currently, there is no requirement in the industry that describes a minimum specification required for the life extension of ageing wellhead and X-mas tree systems in mature fields and installations.

During this session, life extension principles of the subsea trees wellheads, conductors, risers and the surface equipment WH and XT systems will be introduced with examples of performed assessments, including common degradation mechanisms of system components and the risks introduced.

The ongoing P&A activities on selected assets must also ensure adequate integrity levels are present before executing any decommissioning processes. The culture of accepting integrity as a crucial requirement must be practised throughout the lifecycle of the asset, from design, operations, intervention, life-extension and also decommissioning.

Session 5: Well Integrity during Well Production

Ramy Eid, Kebabangan Petroleum Operating Company Sdn Bhd

Well integrity is a perpetually evolving process, with new challenges, trends and issues appearing as the well stock ages. This panel session will discuss well integrity challenges that operators have to face, now and in the future, as a large number of older fields in the Malaysian offshore market matures.

This session focuses on major areas of well integrity; sharing current industry best practices, novel technologies and risk avoidance methods to mitigate risk to be “As Low as Reasonably Possible” (ALARP). The application of the PETRONAS Procedures and Guidelines for Upstream Activities (PPGUA) to mature and ageing wells will be considered and discussed, illustrated by examples of tangible well challenges faced by current operators.

Existing well integrity practices will be covered on the anticipated remediation and recertification operations. Current cost effective solutions will be presented, demonstrating the benefits to the end user, with the requirement of reducing well field days during re-entry operations to live and underbalanced wells.

An operator perspective will also be presented, with tangible examples of well integrity challenges that are currently facing in the sector. A review of applied solutions will be addressed through examples and guided discussion.

Complex well integrity operations also present challenges during the abandonment phase. The potential for annular well barrier failures will, therefore, be discussed. The challenges of single and dual annular well barrier failures will be quantified from a risk and guideline perspective, and the methods of addressing these will be presented.

Session 6: Asset Life Extension

Session Managers: Johannes Klein, Ridge AS; Suresh Murugian, SGS Malaysia

As primary operating offshore assets are entering their late life stage worldwide, mainly in the aged fields of the North Sea, Persian Gulf, Caspian Sea and the South East Asian Basin, operators are faced with challenges on various fronts in tackling this issue. The assets range from subsea trees, wellheads, conductors, risers and extend to the surface equipment dealing with the production and other aspects of the whole export ecosystem.

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SPE WORKSHOP:
Well Integrity Management
8 – 9 October 2018 | Kuala Lumpur, Malaysia

Would you be willing to give a brief (10-15 minutes) presentation? □ Yes □ No

If yes, please attach the topic with a short abstract of your proposed presentation.

One of the Programme Committee members will contact you to discuss your presentation.

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□ Drilling □ Completions □ Management and Information □ Health, Safety, Security, Environment, and Social Responsibility □ Reservoir Description and Dynamics

Primary Responsibility (Check One)
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Listing background and experience. (Use additional paper if required)

List your expectation for the Workshop, so that the committee can tailor a portion of the Workshop to answering attendees’ concerns. (Use additional paper if required)

Registration Fees (Please tick appropriate box)

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- A processing fee of USD150.00 will be charged for cancellation received thirty (30) days prior to the first day of the workshop.
- 25% refund will be made for cancellation received between twenty nine (29) - fifteen (15) days prior to the first day of the workshop.
- No refund on cancellation received fourteen (14) days prior to the first day of the workshop.
- No refund will be issued if a registrant fails to show up on-site.

This form may be used as a company invoice.
Mail completed registration form with remittance and any supporting material to:

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