## DEIER 2025

# ABSTRACTS PROGRAMME SHAPING TOMORROW — ADAPTING, LEARNING & INNOVATING FOR FUTURE SUCCESS

20 – 21 MAY 2025 P&J LIVE, ABERDEEN

#### www.spe-aberdeen.org/events

The organisers reserve the right to amend the programme as necessary – see website for updates on programme timings or further details.

### Organised by







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### Organisers



DEVEX is a not-for-profit conference run by industry professionals and is the only technical conference of its size which is focused on reservoir discovery, evaluation, development, and recovery in the UK. The event is jointly organised by the Society of Petroleum Engineers (SPE Aberdeen), Geoscience Energy Society of Great Britain (GESGB), and Aberdeen Formation Evaluation Society (AFES).

#### About SPE Aberdeen

The Society of Petroleum Engineers (SPE) is a not-for-profit professional association where more than 127,000 members in 145 countries are engaged in oil and gas and related energy communities. The Aberdeen Section is one of the largest of all the SPE Sections across the world with a thriving community of over 1,500 members from all professions working in the energy sector and supporting 4 Scottish University Student Chapters with over 360 student members.

As well as celebrating 50 years in the industry, in 2024, SPE Aberdeen received recognition by SPE International after winning two Presidential Awards for Outstanding Section, in both the Community Involvement and Technical Dissemination categories. These prestigious awards recognize SPE sections with exceptional programs in technical dissemination, professional development, member engagement, community involvement, operations, or student support.

Over the years, the Section has been recognized with the President's award for 8 consecutive years and has received numerous Gold awards as a testament to the tireless activities of the members and volunteers who contribute.

#### spe-aberdeen.org

#### About AFES

Aberdeen Formation Evaluation Society (AFES) is a chapter of the Society of Petrophysicists and Well Log Analysts (SPWLA). We are a charitable organization, with its primary purpose being to promote the scientific and technical aspects of formation evaluation, for the public benefit, education and knowledge. We do this by facilitating and promoting technical events and talks in the local area, such as lectures throughout the year, and whole day seminars. We make these events cost free where possible or at minimal cost to ensure participants have no financial barriers to access. We also look to foster at a grassroots level through financial grants to fund and promote STEM, making sure children have the tools to progress into further STEM education and hopefully be the next generation of Petrophysicists. Students are awarded grants where they can demonstrate that their projects have a strong component of formation evaluation, to try and encourage students that formation evaluation is an exciting and interesting discipline to pursue. Students are also encouraged to attend our monthly meetings to keep in touch with their needs and to help with their integration into the professional world of Exploration and Production. The success of AFES in accomplishing these objectives is due to the participation, involvement and support of members, colleagues and companies who attend our events. To them, our thanks and long may it continue! If you are not a member, you can easily join via our website for free

#### afes.org.uk

#### **About GESGB**

To advance, for the public benefit, education in the scientific and technical aspects of subsurface energy and related technologies.

The PESGB was established in 1964 by a group of like-minded professionals keen to create a community of geoscientists for networking and sharing ideas. Over 50 years later we have members in every element of the subsurface energy industries, and they are active in six continents.

As the result of a landmark member vote, the society changed its name to be more inclusive of the careers of the members, now and in the future, of this exciting industry.

In March 2023 the PESGB became the Geoscience Energy Society of Great Britain (GESGB). The society will gradually broaden its technical programme while continuing with the current activities. The GESGB welcomes all who work in subsurface energy related fields and is keen to explore the exciting technologies that continue to develop across the sector.

This member led organisation serves our industry by providing, networking and knowledge-sharing events, conferences, and workshops.

Though careers in 'energy' are constantly evolving, the GESGB aims to be relevant, useful, and beneficial to members at every stage of their careers within the 'energy' industry.

#### ges-gb.org.uk

### Our Sponsors

The organisers would like to thank our sponsors and exhibitors.

We are very grateful for your support.

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#### **Event Sponsors**





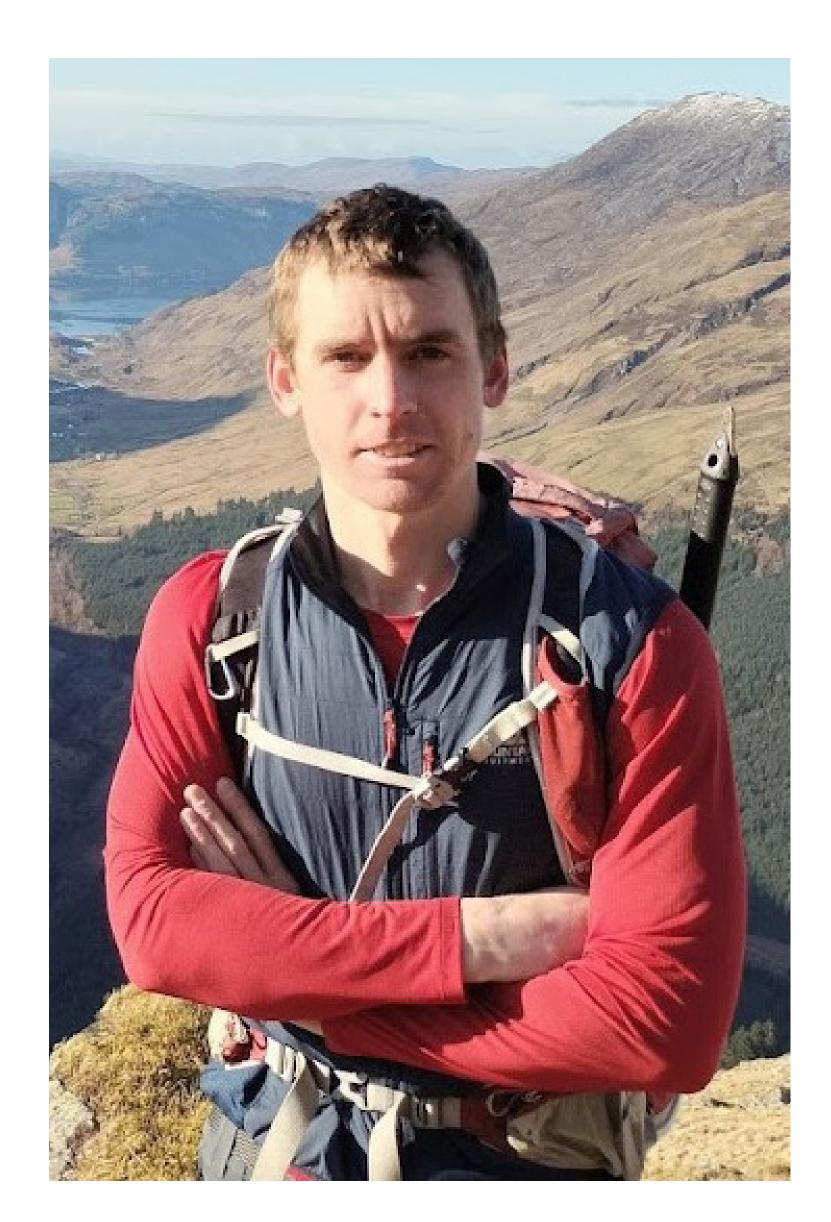




#### Lanyard Sponsor

### Chairperson's Welcome





### On behalf of AFES, GESGB and SPE Aberdeen, it is my pleasure to welcome you all to DEVEX 2025!

For many of us, DEVEX is a highlight of the working year where subsurface colleagues from across the industry come together to share experiences and learnings in a friendly, collaborative environment. Thank you for joining us again this year, for this collaboration and technical expertise is required more than ever in today's challenging operating environment.

DEVEX is the only conference of its kind to bring together technical colleagues from across the full E&P project cycle; from exploration, appraisal, development and production, through to CCUS and decommissioning. I am delighted that our conference programme this year touches on each of these disciplines, highlighting the continued role our industry is taking in providing safe and secure energy here in the United Kingdom.

Our conference theme this year is 'Shaping Tomorrow: adapting, learning and innovating for future success'. We all have a responsibility to ensure our industry can thrive within a net zero future and I hope you can take away some key learnings of where innovation and adaptation have contributed to a successful project outcome.

I'm particularly looking forward to the YP and Early Career workshop on Tuesday afternoon focussed on empowering conversations and bridging the gap between energy and community. The team have done a great job pulling this together, with some excellent speakers. And for those fortunate enough to be attending the DEVEX fieldtrip, I'll see you on the golden sands of Newburgh Beach to conclude the conference.

Lastly, I would like to say a big thank you to our conference sponsors and exhibitors, without whom the conference would not be possible. Thank you to all our speakers, panellists, session chairs, and of course to all the organising committee. See you in the exhibition hall!

#### **Andrew Miles**

**Chair of DEVEX 2025** 

### Accessibility & Venue Information



#### Venue Access

- P&J Live is situated about 6 miles north-west of the Aberdeen City Centre and easily reached from the Aberdeen Western Peripheral Route and A96 Aberdeen-Inverness Road.
- Entrance to the site is situated on Dyce Drive.
- If using Sat Nav, please use the postcode AB21 9FX.
   Further details can be found on the venue website here
- Details of public transport can also be found on the venue website <u>here</u>
- The 'Jet 727' service runs every 10 minutes between
   Union Square and the Airport and there is a bus stop located on the P&J Live site.
- The venue is wheelchair accessible with ramps and elevators available.
- Accessibility Information on the venue can be read <a href="here">here</a>

### Security

- Security will be at the venue and will perform bag checks so please leave enough time for arrival.
- Please take a form of photographic ID with you.
- Delegates are advised to look after their own belongings.
   Neither the organisers nor P&J Live can be held responsible for any loss of items.

### Car Parking

When arriving at the venue by car, please use the Sub-T car park or the North Car Park. Both are signposted from the site-entrance. Parking will be free of charge for conference attendees, but you must submit your registration number via our Survey Monkey at the following link in order to take advantage of this:

#### **INSERT REGISTRATION NUMBER HERE**

If you forget to do this in advance, you will also be able to scan a QR code and complete the form when you are attending the event. Once your registration number has been submitted, you don't need to do anything else in the car park, just drive out at the end of the day. No need to visit the parking machines.

### Accessible Parking

- Blue Badge parking is subject to availability on a first come first served basis. Accessible parking is available in both the overground and Sub-T car park levels.
- Entry to the Venue
- When entering via the Sub-T car park, make your way up the escalators towards the Halls for registration.

### Registration

- When you reach the registration desks outside the Conference Suites, you will be given a lanyard.
- Please note, passes are not transferable.
- The registration desk will be open for registration and general enquiries between 08:00 – 17:00 each day.

#### Refreshments & Lunch

 Tea/coffee and lunch is available during the scheduled breaks throughout the conference. If you have any food intolerances or specific dietary requirements, please inform a member of the P&J Live catering staff.

### Abstract Programme

Abstracts from DEVEX have been published in this
programme. Approved final presentations will be uploaded
to the Knowledge Section of the SPE Aberdeen website
after the event. In our efforts to keep this a sustainable
event, we are not printing the abstract programme, it will be
available digitally only.

### Contact Details

Organisers – Mearns & Gill 01224 646311 devex@mearns-gill.com

### Keynote Presenters





Gail Anderson,

#### Research Director, UK North Sea Upstream, Wood Mackenzie

Gail is a highly experienced upstream analyst at Wood Mackenzie. Gail joined the company in 2004 covering the UK North Sea, and in 2007 led the development of our upstream coverage of central and eastern Europe.

Gail has also worked in other regions including Russia and Sub-Saharan Africa.

Notably between 2010 and 2023 Gail successfully grew the company's research on the Nigerian upstream industry and its gas and power sector.

During this period Gail provided in-depth coverage of Nigeria's proposed fiscal reforms in the Petroleum Industry Bill which finally became law in 2021. This involved presenting to the CEO of NNPC, the Presidential Advisory Committee and the head of OPEC.

In 2023 she returned to lead Wood Mackenzie's research on the UK North Sea

Gail has participated on numerous consulting projects to a range of clients on corporate strategies, opportunity screening, gas and power markets and most recently on decarbonisation and the Energy Transition.

Gail started her career at IPA Energy Consulting in 1999. She participated in power sector reform projects in Sub-Saharan Africa, Eastern Europe and the FSU.



lain Lewis,

#### **Chief Financial Officer, Ithaca**

lain Lewis is the CFO of Ithaca Energy plc a leading independent oil and gas company in the UK. Iain is a Chartered Accountant with over 25 years of upstream oil and gas finance experience in public practice and the multinational corporate environment. Starting his career with 10 years at EY in the UK and Canada, Iain then joined the Abu Dhabi-listed TAQA Group where he held various Executive roles in Europe and globally including the Group Deputy CFO role. Joining Ithaca as CFO in July 2022 Iain helped lead the company through IPO on the London Stock Exchange later that year, and through 2024 led the company as Interim CEO through the negotiation and close out of the business combination with Eni which created the Ithaca of today.



### Peter Kavanagh,

#### **Chief Operating Officer, Anasuria Operating Company**

Peter Kavanagh is the Chief Operating Officer of Anasuria Operating Company (AOC), a position he has held since 2020. A Chartered Engineer and Chartered Manager, Peter brings over 30 years of experience in the oil and gas industry, with a career spanning senior leadership roles across the UK and the Middle East. Before joining AOC, Peter spent 13 years at Petrofac, where he served as Operations Director for UK Central North Sea Operated Assets - including Anasuria - as part of his portfolio. Prior to that, he spent 15 years at Shell in a range of operational and leadership roles, including Offshore Installation Manager on multiple North Sea assets.

### Conference Programme - Day 1



0.00	0.00			
	9:00	REGISTRATION		
9:00	9:10	Opening Remarks - Andy Miles, Harbour Energy		
09:10	10:15	Keynote Session and Panel Discussion - Gail Anderson, Research Director, UK North Sea Upstream, Wood Mackenzie   Iain Lewis, Chief Financial Officer, Ithaca   Peter Kavanagh, Chief Operating Officer, Anasuria Operating Company		
10:15	10:45	COFFEE BREAK + CORE DISPLAY & EXHIBITION		
10:45	11:10	ABANDONMENT MASTERCLASS  Zero-Leaks. Forever. Is there a place for pragmatism over perfection in well abandonment?  Ruth Thomas, Well-Safe Solutions	Low Carbon Cross Border Exploration and Development. <b>Geoff Minielly &amp; Joseph Sherratt, Equinor</b>	
11:10	11:35	Downhole Validation of a Novel Through-Tubing Cement Evaluation Tool.  Jack Willis, Go Well Petro	Tectonostratigraphic Evolution of the Triassic in the Northern North Sea Rift: Insights from the Utsira High Area. Riccardo Sordi, University of Aberdeen	
11:35	12:00	Geochemical Applications in Asset Integrity and Decommissioning Projects.  Emma Straughan, Applied Petroleum Technology	Once Bittern, Twice Shy – The Drilling and Results of the Gilderoy Exploration Well.  Matthew Gibson, Harbour Energy	
12:00	12:25	Abandoned Well Leak Rate Models: From Analytical to CFD. Philip McCurdy, Axis	Change the default colourmap for effective data visualisation with colour. Lindsey Smith, bp	
12:25	13:30	LUNCH + CORE DISPLAY & EXHIBITION		
13:30	13:55		A New Program of Special Core Analysis for Morecambe Net Zero.  Fabrizio Conti, Spirit Energy	
13:55	14:20		Fit-for-Purpose Subsea Well P&A across the UKCS & NCS. Mike Avery, OneSubsea	
14:20	14:45		A simple Tertiary regional geological model to help geopressure assessment In Quad 22 and adjacent areas. <b>Peter Evans, Repsol</b>	
14:45	15:10		Ensemble modeling, where are we heading? Veronica Arrigoni, Halliburton	
15:10	15:15		Optimising Reservoir Management with Advanced Tracer Technologies: Insights and Case Studies. <b>Hossein Anbari, Tracerco</b>	
15:15	15:20	energy and community, by YP and Early Career Committee	Bringing Harmonry to Drilling and Geoscience Data Communication.  Romulo Cuevas, ROGII	
15:20	15:55		COFFEE BREAK + CORE DISPLAY AND EXHIBITION	
15.55	16:00		Repurposing Reservoirs: A Risk-Based Approach to Managing Legacy Wells in the Energy Transition. Nick Low, Elemental Energies	
16:00	16:25		Enhancing Late Life Performance: Using Machine Learning & Artificial Intelligence for intervention candidate selection. Rachel Luxton-Howard, SLB	
16:25	16:50		Increase the Modelling Accuracy of Autonomous Flow Control Technology in Near Wellbore Simulators by Utilizing Script. <b>Henrik Ågrav, InflowControl AS</b>	
16:50	17:15		Improving the structural-stratigraphic interpretation of the Puffin field using combinations of geological knowledge and Machine Learning model. <b>Mahendra Aditiakusuma &amp; Nicole Duffin, Shell</b>	
17:15	19:00	NETWORKING RECEPTION + CORE DISPLAY & EXHIBITION		



DEVEX 2024

Technical Talks

Techbytes

Masterclass

YP Session

### Conference Programme - Day 2



Technical Talks

Techbytes

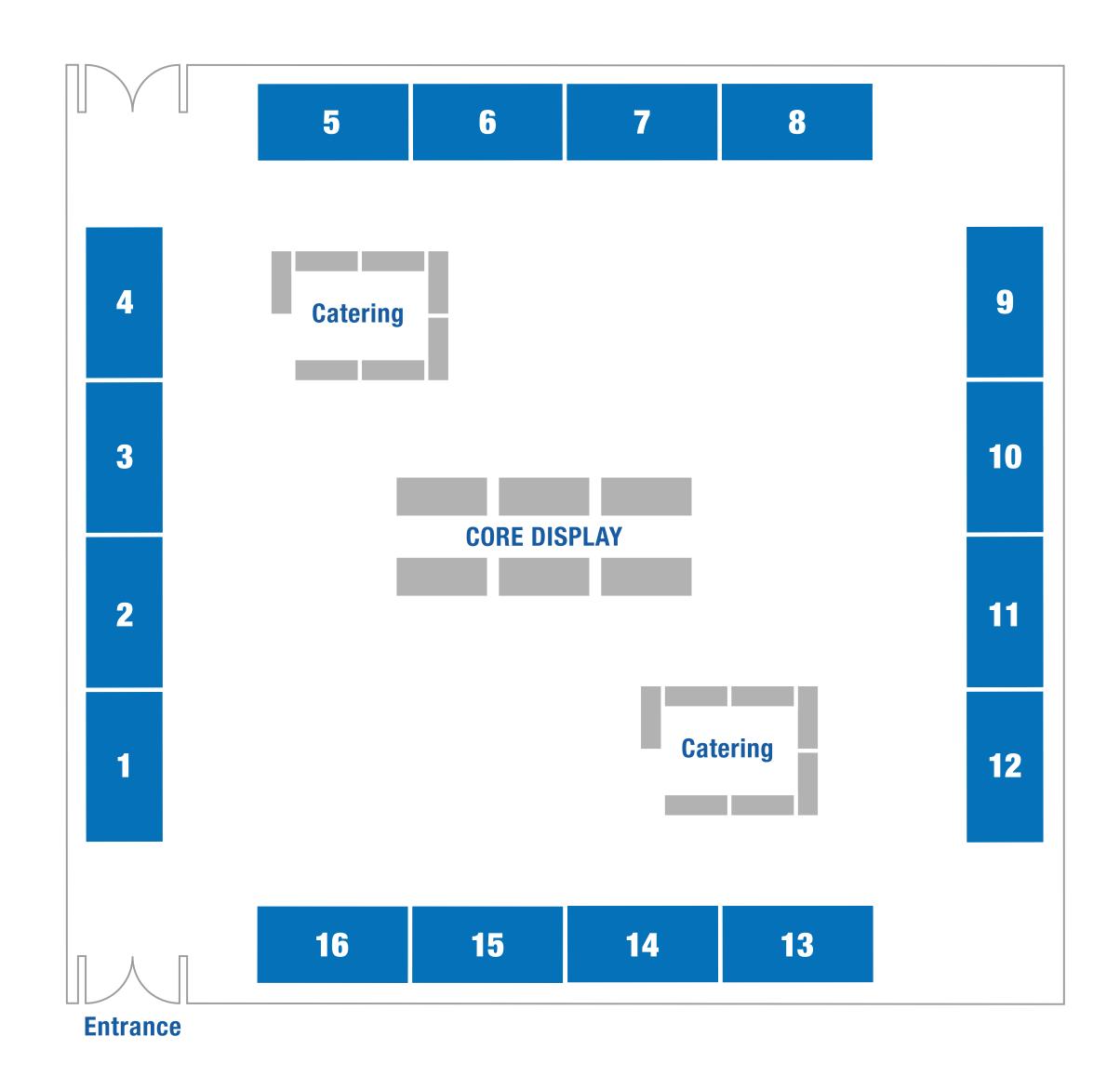
Masterclass

**YP Session** 

8:00	9:00	REGISTRATION	
9:00	9:25	Losing or securing supply: The potential of undeveloped gas discoveries to boost the UK's energy security. Claire Black, Welligence Energy Analytics	
9:25	9:50	Talbot Field - Appraisal and Development. Carl Elliott, Harbour Energy	
9:50	10:15	Bittern Field: Seismic and Geologic Lessons Learned from the Ultra-Deep Resistivity Data Acquisition of a Successful Late Life Infill Producer. Florence Henriet, Dana Petroleum	
10:15	10:45	COFFEE BREAK + CORE AND EXHIBITION	
10.45	11:10	Climate litigation: understanding Finch and its impact on consent decisions - Presenter is Niall McLean, Brodies Solicitors	
11:10	11:35	Optimizing Well Abandonment: Schooner Field Insights on Salt Creep, Barrier Integrity, and Cost Savings. Alhadi Zahmuwl, SLB	
11:35	12:00	Guillemot North-West Field: Seismic Interpretation versus Ultra-Deep Resistivity Inversion on a Successful Late Life Infill Producer. Adam Baldwin, Dana Petroleum	
12:00	12:05	Are you a Reservoir Engineer? Come and join the Investigator fan club. Gonzalo Notivol Lazaro, Cegal	
12:05	12:10	Behind-Casing Fluid Typing Using Ultrasonic Logs for Plug and Abandonment Applications: Enhancing Efficiency. Alhadi Zahmuwl, SLB	
12:10	13:15	LUNCH CORE AND EXHIBITION	
13:15	13:40	Additional Perforations in the Pentland formation – High Uncertainty Led to High Case Gains. Hamish Dunnett, TotalEnergies	
13:40	14:05	Power-Efficient Pump Optimisation and Production Assurance: Reducing Power Demand and Carbon Emissions while Maintaining Production. Gerald Ihedilionye, Enquest	
14:05	14:30	Reinstating production from an HPHT extended reach gas-condensate well following a complete wellbore scale blockage and managing subsequent production, Jade. Steve Bolton, Harbour Energy	
14:30	14:55	Wireless Control And Monitoring; The Next Generation Downhole Completions. Gumru Akhundova, bp and David Eze, TAQA Well Completions	
14:55	15:20	COFFEE BREAK CORE AND EXHIBITION	
15:20	15:45	Modelling CO2 Flux Regimes Post-Injection – Diffusion, Convection and Gravity Slumping. Sean Kelly, University of Aberdeen	
15:45	16:10	Morecambe Net Zero (MNZ) Integrated Field Modelling Study. Akkassin Abdullayev	
16:10	16:35	Third Time's a Charm, the NW Seymour production well story. Alex Thatcher, Harbour Energy	
16:35	17:00	Sanctioning 5 Late-Life Infills on Mungo: Combining individual probabilistic subsurface outcomes into a single portfolio assessment for better predictability. Benjamin Twigger, bp	
17:00		CLOSING REMARKS (AFES)	

### Exhibition Floorplan





1	Rock Flow Dynamics
2	Geologix
3	Petrostrat
4	ROGII
5	Core Technical Services
6	Elemental Energies

7	TGT Diagnostics
8	Resman
9	Axis
10	Zenith
11	Tracs
12	GESGB

	13	SPE
	14	Geoteric
	15	inflow control
	16	ERCE

### DEVEX YP and Early Careers Event | 20 May 13:30-17:00



### Empowering conversations, bridging the gap between energy and community

We believe that it is imperative that those of us working in the upstream energy industry in the UK become more vocal and challenge the perspectives often portrayed in the media. It is becoming increasingly clear that we need to actively participate in advocating for our careers and our industry. If YPs want there to be an industry to be employed in the future, then we need to be part of the solution. This event is a call to action for those in the early stages of their careers to learn from science communication experts about how to engage with the general public about the importance of our industry. The goal is to affect policymakers, but this must start by getting the general public on our side. This DEVEX YP event will give YPs to learn from science communication experts how to advocate for their own careers. Participants will also learn about effective communication techniques which are also beneficial in every day work environments.

This is a free event from 13:30-17:00 as part of DEVEX 2025. Thereafter, delegates can attend the main Networking Reception and then the Energy on Draft event.

#### Our speakers are



### **Christopher Banks**,

SLB

Geoscientist Chris Banks transitioned to sustainable energy consulting in 2016 after years in oil and gas. With an MSc in Sustainable Energy Solutions, he now develops blue/green hydrogen projects in Scotland with the Net Zero Technology Centre while advocating for corporate climate action.

"We have the experience, but you have the future. This event is as much about us listening to you as it is about sharing our insights."



Lucinda Layfield,

**Equinor** 

Lucinda serves as management assistant to Equinor's UK
Senior Vice President while supporting the UK management
committee across multiple business areas. Lucinda joined
Equinor in 2022 as the Rosebank field asset geologist, working
on west of Shetland exploration opportunities and leading

subsurface initiatives. Lucinda holds degrees in Petroleum Geoscience and Geology, has published research on UK and Norwegian Continental Shelf petroleum geology, and currently co-coordinates the Equinor/Shell UK Integrated Joint Venture project while chairing an employee resource group. In 2023, she raised nearly £15,000 by running 30 marathons before turning 30.

"Come along to hear me share practical strategies of how to effectively communicate, based on advice from communications experts, which will include advice of how to have hard conversations and sharing tips of where you can find key facts to equip you with the knowledge you need to challenge perceptions."



Henk Kombrink,

Following a career as a geologist, mainly working on regional projects in the greater North Sea region, Henk took on the editor role for GEO EXPRO in 2022. Reporting from his home in Aberdeen, he is always on the hunt for good stories where energy and subsurface meet. In addition to taking care of the

content of the magazine, he also runs North Sea Core, a community interest company that distributes cores from oil and gas wells in the UK North Sea.

"Don't try to be exhaustive, try to pick up on that single thing that sparks your attention and spin a story around it."



#### **Professor John Underhill**,

University Director for Energy Transition, University of Aberdeen

Professor John Underhill serves as University Director for Energy Transition and Professor in Geoscience and Energy Transition at the University of Aberdeen since March 2022. He directs the UK's GeoNetZero Centre of Doctoral Training, a

£22M partnership that has produced 128 PhDs who all secured relevant employment.

His research focuses on geoscience's role in energy transition and deploying technologies to achieve net-zero goals.

Previously, John co-led Heriot-Watt University's Lyell Centre and served as Chief Scientist. He has advised the UK Energy Minister's Subsurface Task Force and Scottish Government through the Scottish Science Advisory Council (2018-22).

His achievements include serving as President of the European Association of Geoscientists and Engineers (2011-12) and receiving their Alfred Wegener Prize (2016), the Geological Society's Lyell Medal, and its Energy Group's Silver Medal. Uniquely, John was also an international soccer referee for FIFA, UEFA, and the Scottish Premier League (1994-2008).

### **Networking Reception**

Join us for drinks, reconnect with your peers and meet some new contacts! This will take place at the end of Day 1 in the exhibition area. Following this, you are welcome to join the Energy on Draft event at Brewdog!

#### Core

On display in the exhibition area will be a cored section from well 15/21b-50 in the Moray Firth, showing a stunning example of deep-water sands and fines of the Upper Jurassic Claymore Sandstone Member near the Telford field



### Field Trip Wednesday 21 May, 1715, Ythan Estuary

Following the close of the main conference on Wednesday 21st May, Stuart Archer and Andy Miles will lead the DEVEX field trip for an evening visit to the sand dunes and tidal mudflats of the Ythan Estuary, to the north of Aberdeen. There are several distinct habitats within the Ythan Estuary complex including marsh, littoral, estuarine, lacustrine and dunes areas. The Ythan estuary borders the Forvie National Nature Reserve which has the fifth largest sand dune system in Britain, and the least disturbed by human activity. The dune system is an integral part of the Ythan Estuary and separated by the estuary from Balmedie beach.

After touring the estuary and sand dunes (and visiting the seals), an evening meal will be served. A coach will be available to take delegates from the P&J Live to the Ythan at Newburgh and back.

Places are limited and awarded on a first-come first-served basis. Appropriate walking boots (or wellingtons) and warm, waterproof clothing (a set of waterproof coat/jacket and trousers) are required. Anyone not dressed appropriately will not be allowed to attend due to health and safety.

The excursion involves fairly easy walking on paths sand dunes and shore but participants should be aware that it may be slippery in the intertidal zone. Materials: Any required hand-outs/materials will be distributed at the start of the field trip.





#### Low Carbon Cross Border Exploration and Development

Geoff Minielly<sup>12</sup>, Joseph Sherratt<sup>3</sup>

<sup>1</sup>Equinor, London, United Kingdom.

<sup>2</sup> <sup>3</sup>Equinor, Aberdeen, United Kingdom

While the fundamentals of exploration and development in the UK have not changed, the fiscal and political landscape have been reshaped. The industry now faces challenges which requires prospects and developments to be high value with the new fiscal regime while being produced with the lowest carbon footprint as possible. To meet these challenges, Equinor in 2020 began re-evaluating their portfolio surrounding the electrified Martin Linge platform. The acquisition of new state of the art regional broadband, OBN sparse node and 4D seismic in addition to detailed reprocessing and interpretation has reduced the uncertainty on proven reservoirs and high graded our opportunity set. In this presentation we will cover the story up to now and the plans for the future of this exciting opportunity to unlock high value, low carbon barrels through cross border collaboration.

### Tectonostratigraphic Evolution of the Triassic in the Northern North Sea Rift: Insights from the Utsira High Area.

Riccardo Sordi, Adrian Hartley, Spyridon Saltapidas, Shaan Heydenrych

University of Aberdeen, Aberdeen, United Kingdom

The study presented here aims to understand the controls on sediment drainage systems in the Utsira High area, Northern North Sea. Utilising a recently established tectonic and chronostratigraphic framework, the study focuses on determining the nature, timing, and sedimentary response to active faulting during the Triassic time across the Northern North Sea region.

The study area encompasses the Viking Graben and Stord Basin, spanning from the UK to the Norwegian sectors. Despite the rich record of well and seismic data, a unified litho- and chrono-stratigraphic scheme for the Triassic succession in this region has been lacking. This research addresses this gap by proposing lithofacies and facies associations constrained by biostratigraphic data to define depositional environments throughout the Triassic period.

The methodology includes a comprehensive analysis of core data, focusing on lithological and petrophysical characteristics, and observed facies associations. The study presents correlation panels and a series of paleogeographic maps highlighting the region's stratigraphic evolution. This research aims to revise our understanding of the North Sea rift basin development, test predictive models of facies distributions within active rift systems, and create a basin-scale framework for further research with potential applications in reservoir quality prediction and CO2 storage assessment.

### Once Bittern, Twice Shy – The Drilling and Results of the Gilderoy Exploration Well

Peter Morgan<sup>1</sup>, Matt Gibson<sup>1</sup>, Iain Mearns<sup>1</sup>, Edward Downer<sup>1</sup>, Stefano Pugliese<sup>1</sup>, Rod Crawford<sup>2</sup>, Peter O'Mara<sup>2</sup>

<sup>1</sup>Harbour Energy, Aberdeen, United Kingdom. <sup>2</sup>Neo Energy, Aberdeen, United Kingdom

Gilderoy was drilled in October 2024 and an oil discovery was made in the high-quality Bittern and Upper Forties sandstones with 174 ft of hydrocarbons encountered. A full suite of high quality LWD and wireline logs was acquired, while pressures, fluid samples and 240 ft of continuous core were also obtained enabling high quality characterisation of the reservoir. Gas, oil, and water legs have been identified; NMR logs have enabled greater understanding of thin beds in the upper Forties, and core has enabled understanding of the relationship between the Upper Forties aquifer and the Bittern reservoir which would otherwise have been challenging.

Gilderoy is an AVO class III amplitude anomaly in a four-way dip-closed Eocene turbidite sand channel. It lies in the Greater Britannia Area, Block 15/28b, licence P2522. The licence is operated by Harbour Energy (65%) with partner NEO Energy (35%).

This presentation will show the pre-drill assessment of the prospect, the well results, data acquisition and initial post-well interpretation of the accumulation that was one of the rare exploration wells drilled in the UK in 2024.

### Change the default colourmap for effective data visualisation with colour

Lindsey Smith, Robert Gooder, Chris Hill bp, Aberdeen, United Kingdom

Effective data visualisation is critical for scientific data analysis, clear communication and compelling storytelling. In applied geoscience, colour is frequently used to visualise data such as 3D surfaces, seismic attributes and reservoir properties and most geoscience software offers a wide, sometimes bewildering, variety of colourmaps from which to choose. Many of these colourmaps, including the commonly used rainbow, are poorly suited for scientific accuracy in data visualisation. These colourmaps, despite their vibrant appearance, introduce visual distortions, obscure details and cause artefacts that misrepresent the data.

The persistence of rainbow colourmaps over the past 30–40 years stems from user familiarity, aesthetic appeal, and a lack of understanding about the visual distortions they impose. These issues are rarely analysed or addressed within standard visualisation software, leading to widespread misuse across applied geosciences.

This presentation highlights the challenges of traditional colourmaps and demonstrates the advantages of scientific alternatives. Through case studies and comparative analysis, it is possible to show how scientific colourmaps avoid distortion, allow discrimination of detail, and improve accessibility, particularly for individuals with colour vision deficiencies. Real-world examples emphasise how changing from default colourmaps to scientifically robust ones leads to clearer, more intuitive, and more accurate data visualisation.



#### A New Program of Special Core Analysis for Morecambe Net Zero

Fabrizio Conti<sup>1</sup>, Callum Inglis<sup>2</sup>

<sup>1</sup>Spirit-Energy Petrophysicist, Aberdeen, United Kingdom. <sup>2</sup>Spirit-Energy Geologist, Aberdeen, United Kingdom

The North and South Morecambe gas fields, located in the East Irish Sea, have produced over 6.6 tcf of gas from the Triassic Sherwood Sandstone reservoirs since the 1980's. The reservoirs are sealed by interbedded mudstones and halites of the Triassic Mercia Mudstone Group. These two fields are currently approaching the end of their production and are now being assessed for carbon storage.

An integrated static, dynamic and geo-mechanic modelling study is ongoing to assess the potential of the Morecambe fields for CO2 injectivity and storage capacity, and to support a Containment Risk Assessment, the development of a Monitoring Plan and the design of potential injection facilities.

The study includes a petrophysical evaluation of the storage complex, including a new program of Special Core Analysis (SCAL) to complement the historic data with specific core Geomechanics, Formation Damage and Relative Permeability tests: to assess the effect of CO2 on reservoir properties.

The presentation will provide an overview of the tests and how their results have helped reduce the uncertainties of geo-mechanic and dynamic modelling, showing that exposure of the Sherwood Sandstone to CO2 has no significant impact on the geo-mechanical and flow properties of the reservoir.

### Fit-for-Purpose Subsea Well P&A across the UKCS & NCS

#### Mike Avery

#### OneSubsea, Aberdeen, United Kingdom

Subsea well equipment (Christmas Tree, Tubing Hanger c/w Tubing, Wellhead, etc) must be safely retrieved at the end of its lifecycle in line with the governing regulations and legislation. The standard approach to performing this retrieval is simply a reversal of the installation process, however, there is great opportunity for optimisation in an effort to reduce risk and cost. Operational case studies shall be shared from multiple subsea well P&A campaigns performed over the past 12-18 months to explore the potential and support further discussion. These case studies include wells with both vertical and horizontal trees across the UKCS and NCS. Operation design, technology overview, and commercial models shall be presented to provide a holistic overview and engage a

wide variety of disciplines. Operational performance data, including lessons learned, shall be used to inform the discussion and baseline current subsea P&A performance. Key success factors shall be isolated and areas for improvement & development put forth for consideration including innovative techniques and methods, technology gaps, and novel commercial models.

### A simple Tertiary regional geological model to help geopressure assessment In Quad 22 and adjacent areas.

#### **Peter Evans**

#### Repsol Resources UK Ltd, Aberdeen, United Kingdom

A thick rapidly deposited shale sediment pile in the Tertiary of Quad 22 - leads to geopressuring to 13.3ppg in Repsol Montrose and Arbroath oil fields – caused by the lack of dewatering and under-compaction of these shales. The increase in temperature gradients reduces the depth to oil window – meaning hydrocarbons can be generated at relatively shallow depths. The risk of shallow hazards gas in isolated sands also increases. The Forties sandstone beneath is close to hydrostatic pressure as it dewaters to the NW relieving pressure. More extensive sandstone beds interdigitating with the shales relieve the pressure passing north and westwards out of the depocenter. Thinner isolated silts and sands are encountered that transmit the loaded pressure from these shales. As the sequence becomes sandier towards Piper/Claymore, over geological time, pressures bleed away to hydrostatic. Auk on the SW flank holds an intermediate position. In the spirit of supporting good safe drilling/operations, a simple geological model is presented that helps explain why the regional understanding of these Geopressured shales is so important – for wellbore stability during drilling, mitigating against drilling kicks, reducing the chance of encountering high annular pressures during production and decomm and assessing shallow hazards.

#### Ensemble modeling, where are we heading?

#### Jon Sætrom / Veronica Arrigoni

#### Landmark Graphics, Oslo, Norway / Halliburton

Traditional reservoir modeling often focuses on creating a single "best technical case" model by aggregating deterministic representations of subsurface parameters. This sequential workflow, often rooted in outdated methodologies, hinders accuracy, agility, and collaborative decision-making. Furthermore, it fails to adequately account for uncertainty in subsurface data and interpretation, resulting in unreliable forecasts and significant financial risks in reservoir development.

Unified Ensemble Modeling represents a paradigm shift in how reservoir models are built and used. Unified Ensemble Modeling is a cloud-based solution for ensemble-

based modeling and decision support that helps quantify uncertainty and mitigate risks in decision making.

Throughout this talk, we will demonstrate the value of the Unified Ensemble Modeling solution for a field in the Norwegian Sea on how to mitigate risks as part of a drilling campaign. By having the ability to systematically generate full ensembles given the past, current, and future static and dynamic data (where the latter is defined through what-if scenarios) in a fraction of the time compared to conventional methods, we ultimately help improve the quality of reservoir decisions.

#### **TECHBYTES**

### Optimising Reservoir Management with Advanced Tracer Technologies: Insights and Case Studies

Hossein Anbari

#### Tracerco, Billingham, United Kingdom

Tracerco's reservoir tracer technology provides critical flow information in both conventional and non-conventional reservoirs, offshore and onshore. Here is a summary of the most popular measurements using chemical tracer technology, offering valuable insights for productivity improvements.

Hydraulic Fracture Diagnostics using Tracer Production Logs™ provide stage flow insights correlated with drilling, completion, stimulation, and production data. This technology confirms crossflow between wells, detects production constraints, and measures fluid movement between wellbores.

Inflow measurement solution offers a long-term view of well performance, identifying oil and water entry points, clean-out effectiveness, and the status of plugs, packers, or sleeves.

Inter-well chemical tracers assess the movement of injected water, hydrocarbon gas, and CO2 to production wells, providing insights into injector-producer communication, breakthrough timing, and reservoir properties. Tracer studies help determine fault block communication, fluid source, and sweep efficiency.

Single well chemical tracer tests (SWCTT) and inter-well partitioning tracer tests (IPTT) measure remaining oil saturation around wellbores or between wells. These tests are used for field valuation, enhanced oil recovery (EOR) method selection, and risk reduction in EOR scale-up.

In this technical talk, Tracerco will present a general overview of its tracer technologies as well as a new inflow measurement case study.

### Bringing Harmony to Drilling and Geoscience Data Communication

Romulo Cuevas<sup>1</sup>, Julian Chenin<sup>2</sup>, Joanna Hansford<sup>1</sup>, Daniel Wessel<sup>3</sup>, Jay McLelland<sup>4</sup>, Bruce Ripley<sup>4</sup>

<sup>1</sup>ROGII, London, United Kingdom. <sup>2</sup>ROGII, Houston, USA. <sup>3</sup>Innova, Houston, USA. <sup>4</sup>Innova, London, United Kingdom

Effective communication between geoscientists and directional drillers is critical for achieving optimal well placement, particularly in horizontal wells where navigating complex reservoir geometries is paramount. This study introduces an automated, API-driven workflow designed to enhance collaboration and real-time data synchronization between geosteering and drilling operations. Traditionally, target line projection updates, which guide wellbore trajectory adjustments based on Logging While Drilling (LWD) data, have been shared through inefficient methods such as emails, text messages, and phone calls. This manual approach often results in delays, miscommunication, and errors.

The proposed workflow enables geologists to update target lines in geosteering software in real-time, with these updates automatically transmitted to directional drilling software. The directional driller can instantly implement new well plans while maintaining alignment with the updated geological interpretation. The workflow incorporates a feedback loop, ensuring geologists receive real-time updates on the well plan and trajectory adjustments.

This method was deployed in unconventional operations, demonstrating improved well-placement accuracy, enhanced collaboration, reduced non-productive time, and seamless data transfer. By automating data exchange and minimizing manual interventions, the workflow fosters efficiency and scalability, providing a foundation for future integration with broader data management frameworks.

### Repurposing Reservoirs: A Risk-Based Approach to Managing Legacy Wells in the Energy Transition

**Nick Low** 

CEng, Fellow of the Institute of Chemical Engineers, Aberdeen, United Kingdom

The energy transition offers a potential extended lease of life for existing hydrocarbon reservoirs. Managing the risk of the existing wells infrastructure is demanding a higher level for scrutiny, not only of the existing "live" well stock, but also requires a revisit and re-assessment of any previously abandoned wellbores or wells that are located within the planned store and complex. All existing well barriers must be identified and the likelihood of any potential leak assessed, quantified, and remedied if and when required.

A multi-discipline methodology has been developed to provide a structured approach to define the current "well integrity status" for the store and complex, identifying all verified well barriers and then quantifying potential leak paths. The output enables prioritisation and focus areas for development of optimised remedial and monitoring plans.

The advantages of a "standard" approach provides flexibility for easy adaptation on any CCS/CCUS project. The methodology can also be applied to hydrogen storage or conventional hydrocarbon storage projects. This has been tested and applied to a real-life reservoir conversion project in Europe.

We are currently in discussions with the client to potentially jointly submit and/or approval to reference them during the presentation if we are successful.





### Enhancing Late Life Performance: Using Machine Learning & Artificial Intelligence for intervention candidate selection.

Rachel Luxton-Howard<sup>1</sup>, Farisha Ragbirsingh<sup>2</sup>

<sup>1</sup>SLB, Aberdeen, United Kingdom. <sup>2</sup>Shell, Aberdeen, United Kingdom

In today's oil and gas market, production enhancement is vital, to realise additional barrels from existing assets in a timely, economic & carbon efficient manner. Delivering production enhancement requires a successful intervention program. Traditionally, this is a time-consuming process, involves a multi-discipline team following a defined well review process. This includes screening of well performance, identification of intervention candidates, quantification of post intervention production gain and selection of intervention type. Data gathering from multiple systems is required alongside significant analysis.

SLB and Shell UK collaborated, to pilot a data driven approach to intervention candidate selection. This methodology integrated artificial intelligence (AI) and machine-learning (ML) techniques with proven engineering workflows. The objective was to evaluate the output of an automated well opportunity maturation process Vs existing well summaries and intervention priorities. The pilot used a data driven methodology to analyse production, petrophysical and integrity data for over 50 wells, to identify opportunities to add production and shut off high water cut zones. Further integration of machine learning techniques enables the solution to identify high-production potential zones within existing wells – behind casing opportunities (BCO), acid stimulations and water shut offs.

This approach, underscores the transformative potential of data-driven analysis in optimizing production strategies.

### Increase the Modelling Accuracy of Autonomous Flow Control Technology in Near Wellbore Simulators by Utilizing Script.

Henrik Ågrav

InflowControl AS, Porsgrunn, Norway

Accurately modeling autonomous completion is critical for optimizing production and reducing operational costs in the industry. The standard autonomous-equation, commonly used to describe autonomous inflow control devices (AICDs) behavior, struggles to achieve precision when flow performance deviates from a continuous function—especially for water at higher differential pressures.

This project introduces a script-based method to model the performance of autonomous inflow control valves (AICVs), and new technology such as the autonomous outflow

control valve (AOCV) and the Gas AICV. These devices have variable flow areas influenced by fluid properties, composition, and differential pressure. The new approach employs equations with logic-based adjustments to address the limitations of traditional models in simulating complex single- and multiphase flows.

The script methodology improves accuracy by reducing model error in both mathematical and simulator comparisons. It has been successfully tested in real well scenarios, demonstrating better alignment with experimental data and outperforming built-in autonomous equation models in standard reservoir simulation tools.

Accurate autonomous completion modeling enables operators to predict unwanted water and gas production or injection more reliably, directly impacting pump sizing and reducing handling costs and emissions. Scripts offers a flexible and widely applicable solution for improving production estimates and supporting sustainable operational decisions.

### Improving the structural-stratigraphic interpretation of the Puffin field using combinations of geological knowledge and Machine Learning model.

Mahendra Aditiakusuma, Nicole Duffin Shell UK Limited, Aberdeen, United Kingdom

Machine learning models for seismic fault interpretation are commonly trained using global examples of faults and/or synthetic models. In the Puffin field, the team discovered significant benefits of incorporating regional geological knowledge to train the machine learning model. This interpreter-guided machine learning model has helped to generate a structural-stratigraphic framework that is consistent with the geological concept.

Due to a complex history with multiple regional extension episodes and halokinesis, the reservoir in the Puffin field experienced significant faulting with varied and complex fault geometries. The pod-interpod depositional model has been used to understand the development of Triassic and Jurassic mini-basins, and the significant lateral changes in lithology evident from the well data. 2D reconstruction was performed to support the development of the geological model, revealing that the time of grounding of some Smith Bank pods onto the underlying Rotligendes has a significant impact on the styles of faulting developed subsequently. This geological model was then be utilized to guide the machine learning model for seismic fault interpretation.

Compared to a pre-trained machine learning models, this interpreter-guided model has significantly fewer false-positive and shows improved faults geometries. Thus, it improved the faults interpretation and reduced structural uncertainty of Puffin field.

#### **Abandonment Masterclass**

### Zero-Leaks. Forever. Is there a place for pragmatism over perfection in well abandonment?

**Ruth Thomas** 

Well-Safe Solutions, Aberdeen, United Kingdom

Our objective when it comes to well abandonment is "zero leaks, forever". And the concept of isolating drilled formations to prevent fluid escape to the surface, or other formations, is a very valid one, driven by environmental protection and regulatory compliance.

But it can be an ambitious target in some cases, and one which places a huge strain on the industry as we strive for perfection over pragmatism. The reality is that even the most effective geological seals have some inherent permeability, attested to by the numerous hydrocarbon seeps at the surface which first indicated the existence of 'black gold'.

This reality is particularly pertinent to the abandonment of wells which penetrate shallow gas zones in the overburden. Operations to achieve isolation in these large casing sizes set against weak formations can be very challenging, expensive and ultimately may be doomed to failure.

This paper will consider the regulatory landscape, discuss how and why we must combine rigorous and accurate subsurface description with effective barrier design, discuss the new technologies available for shallow abandonment, and illustrate instances where an ALARP position was justified due to the impacts of trying to achieve perfection.

#### Downhole Validation of a Novel Through-Tubing Cement Evaluation Tool

Mohamed Larbi Zeghlache<sup>1</sup>, Alexander Tarasov<sup>2</sup>, Qinshan Yang<sup>2</sup>, Marvin Rourke<sup>2</sup>
<sup>1</sup>Saudi Aramco, Dhahran, Saudi Arabia. <sup>2</sup>GOWell International, Houston, USA

The TTCE tool leverages Selective Non-Harmonic Resonance (SNHR) technology to overcome limitations of traditional acoustic methods in multi-string configurations. In field trials, the tool's continuous square-wave excitation drives resonance within the multi-string structure, allowing measurement of energy loss to evaluate casing-cement and cement-formation bonds. Key new features include an eccentricity-corrected cement map, admittance and frequency data from all six receiver segments, and actual eccentricity angle measurements for enhanced quality control and assurance. The tool's performance was assessed both in real-time data acquisition software and in post-processing workflows.



Field trials confirmed that the TTCE tool consistently provided high-quality data in challenging downhole conditions, achieving sensitivity above 10% and SNR over 10 dB, aligning with previous lab results. The tool demonstrated reliable repeatability, both between runs and across multiple prototype units, reinforcing its suitability for consistent downhole cement bond assessment. Enhanced data outputs, including the eccentricity-corrected cement map, segmental admittances, frequency readings, and real-time eccentricity angle, enabled precise quality control. Resonance energy consumption measurements successfully identified cement bond quality across complex multi-string layers. The comparison of downhole field data to lab results validated the TTCE tool's robustness in providing high-resolution, eccentricity-corrected cement mapping without requiring tubing removal.

### Geochemical Applications in Asset Integrity and Decommissioning Projects.

Emma Straughan, Craig David Barrie, Lloyd Jones Applied Petroleum Technology, Conwy, United Kingdom

Well abandonment planning requires operators to have a comprehensive understanding of well integrity and potential zones where hydrocarbons may be released from within the wellbore. Gas and fluid samples from annuli and/or seabed seeps during ROV inspection and monitoring can provide valuable insight into this integrity. Gas sources can be biogenic, thermogenic, a mixture of the two or generated via other processes, such as corrosion. To determine potential source(s) of hydrocarbon occurrences, gases need to be analysed for their chemical and isotopic (13C & D) composition and compared to 'benchmark' data such as recent injection or production gases. Fluid samples can also be analysed and compared to reservoir fluids and/or any fluids used during drilling and maintenance of the platform. In conjunction with geochemistry, the evaluation of mud gas data, collected during drilling, using APTs Girasol software, can identify and evaluate gas occurrences throughout the wellbore but specifically within the overburden which may be the source(s) of or contributing to gases within the annuli. In this paper we will outline the utility of these workflows and analyses, using examples from the North Sea, for evaluating well integrity and its crucial importance as part of the decommissioning process.

#### Detailed annular cement integrity models for CO2 injection

Philip McCurdy<sup>1</sup>, Juan Carlos Chavez<sup>2</sup>, Mike Byrne<sup>1</sup>, Edgar Castillo<sup>1</sup>, Maria Chavez<sup>2</sup>

<sup>1</sup>Axis, Aberdeen, United Kingdom. <sup>2</sup>Axis, Lisbon, Portugal

Ensuring the integrity of annular cement in CO2 injector wells is critical for maintaining long-term well performance and achieving project sustainability. This presentation will demonstrate the ability of finite element analysis (FEA) and computational fluid dynamics (CFD) to assess the mechanical and thermal behaviour of key completion components in scenarios of CO2 injection. The model includes tubulars, annular cement, and the surrounding rock formations. A key focus is the effect of temperature differences between the injected CO2 and in-situ formation temperature, which can induce significant thermal loads due to the varying thermal expansion properties of wellbore materials. In depleted gas reservoir a particularly large amount of cooling can occur due to Joule Thomson effects, this scenario cannot adequately be handled using standard casing integrity modelling approaches. These thermally induced stresses could lead to cement debonding, micro annuli formation, or other integrity issues. Such scenarios would potentially jeopardise zonal isolation and well longevity. By quantifying these thermal effects, this research aims to optimize completion design strategies, ensuring structural resilience and the achievement of CO2 injection targets. The insights gained will support more robust well designs, enhancing CO2 storage efficiency and long-term containment integrity in carbon capture and storage (CCS) projects.



### Losing or securing supply: The potential of undeveloped gas discoveries to boost the UK's energy security

Claire Black

#### Welligence Energy Analytics, Edinburgh, United Kingdom

In the UK the gap between domestic gas supply and demand is ever increasing, and companies are facing a challenging fiscal environment and increasingly stringent GHG emission targets. Recent exploration success in the gas basin has the potential to add value to current hubs by reducing their emissions intensity and extending their lifespan. However, this is increasingly time sensitive as mature fields cease to produce and critical infrastructure is removed.

In this talk, we will discuss if the remaining undeveloped discoveries could supplement gas production or if they are at risk of being stranded. We will examine the many challenges to development that these discoveries face today. A focus on the Southern North Sea will assess the potential value in relation to UK gas supply.

#### Talbot Field - Appraisal and Development

Carl Elliott, Simon Robinson, Peter Morgan, Anna Fletcher, Zubin Jehanghir, Alex Thatcher, Yann Jehanno, Ellen Robison, Peter Henderson, Michael O'Donnell, Conor Kane, Stuart Abbot, Frazer Barclay

#### Harbour Energy, Aberdeen, United Kingdom

The Talbot Field came on production in November 2024 via a subsea manifold tied back to the Judy Facility. Three geosteered production wells have been drilled along the axis of the field, placed to mitigate against early water breakthrough and potential stratigraphic complexity. Field performance is in line with predrill expectations.

Initially discovered by 30/13-2 in 1972, five further appraisal penetrations were acquired. The latest appraisal campaign (2021) successfully reduced uncertainty and eliminated economically downside development outcomes, prior to the final investment decision and FDP approval in 2023.

The subsurface understanding and characterisation was critical to bringing Talbot to development and optimising well productivity. Amplitude restoration accounting for shallow gas anomalies, improved conformance of geophysical attributes to the structural mapping, increasing confidence in HCIIP. Development of a variable/tilted free water level map accounts for differences in observed/inferred fluid contacts across the structure, providing an upside alternative to a compartmentalised reservoir. Well placement through geosteering and deployment of deep reading resistivity inversion imaging tools, provided mitigation against reservoir complexity and potential compartmentalisation.

### Bittern Field: Seismic and Geologic Lessons Learned from the Ultra-Deep Resistivity Data Acquisition of a Successful Late Life Infill Producer

Florence Henriet, Stuart Pegg, Adam Baldwin Dana Petroleum, Aberdeen, United Kingdom

Bittern producer 29/1b-B1 was shut-in since 2019 due to very high water cut. When drilled in 2000, the reservoir upper interval was in the gas cap and not perforated. With production, oil had migrated into the gas cap and the reservoir upper interval became an infill opportunity.

29/1b-B6 was drilled in 2024 as a horizontal producer utilising Logging While Drilling (LWD) and Ultra-Deep Resistivity (UDR) to optimise reservoir landing, ensure stand-off from the moved oil-water contact, and avoid exiting the reservoir into the unstable overlying shale of the Sele Formation. Seismic data quality is poor due to a gas cloud distorting the shape and positioning of the reservoir boundaries.

29/1b-B6 found the reservoir approx. 30 ft. deeper than estimated but encountered a 40 ft. thick oil interval equivalent to prognosis, ensuring the well was a success. The 2D and 3D images from UDR indicated that an overlying injected sand was influencing the seismic interpretation of the top reservoir. UDR real-time interpretation of the injectite influenced the decisions to cure the losses encountered at its boundary and continue searching for the reservoir. 29/1b-B6 initially produced dry oil at a constrained rate of approx. 6,000 b/d.

### Optimizing Well Abandonment: Schooner Field Insights on Salt Creep, Barrier Integrity, and Cost Savings

Alhadi Zahmuwl<sup>1</sup>, Matteo Loizzo<sup>2</sup>, Richard Houghton<sup>3</sup>, Stein Arild Tonning<sup>4</sup>, Lene Andersen<sup>4</sup>

<sup>1</sup>SLB, Aberdeen, United Kingdom. <sup>2</sup>stag-geological, Berlin, Germany. <sup>3</sup>stag-geological, Aberdeen, United Kingdom. <sup>4</sup>DNO, Stavanger, Norway

The Schooner Field, discovered in 1987, was the first Carboniferous gas development in the North Sea, with production beginning in 1996. Its decommissioning, approved in 2019, involved permanently plugging 12 wells.

The abandonment plan required isolating four flow zones, including the Bunter Sandstone, a shallow regional aquifer proposed for CO storage. Ensuring isolation to 1,000 psi above current pressure was critical for the Bunter Sandstone. However, early well construction did not prioritize isolating this zone. Reported cementing losses raised concerns about the reliability of barriers above the aquifer, emphasizing the importance

of understanding and qualifying Rot Halite as a natural seal.

High-resolution, multi-physics cement evaluation wireline logs from 10 wells revealed how salt creep enhances annular sealing, providing robust well integrity. Validating the effectiveness of salt formations as natural seals eliminated the need for section milling, saving 120 rig days and £13 million.

This case study demonstrates the cost-saving benefits of leveraging creeping salts like the Rot Halite for durable well integrity. It also underscores the critical role of the Rot Halite and Bunter Sandstone in designing abandonment strategies and enabling future CO storage projects.

Ultimately, the Schooner Field experience provides a blueprint for future projects in challenging salt environments.

### Guillemot North-West Field: Seismic Interpretation versus Ultra-Deep Resistivity Inversion on a Successful Late Life Infill Producer

#### Florence Henriet, Stuart Pegg, Adam Baldwin Dana Petroleum, Aberdeen, United Kingdom

The Guillemot North-West field is a mature oil field with the reservoir consisting of sandstones in the Tay Sandstone Member of the Horda Formation. A new infill oil producer as well as an opportunistic pilot hole were drilled in 2024.

21/24-W7 was drilled to de-risk an infill opportunity using Logging While Drilling (LWD) to assess reservoir properties and hydrocarbon saturation, and to calibrate the seismic response at this location. 21/24-W7Z was drilled and completed as an horizontal oil producer, utilising LWD with Ultra-Deep Resistivity (UDR) extensively to optimise the landing of the well in the reservoir, and ensure the horizonal section remained in the reservoir while maximising stand-off from the oil-water contact.

Seismic data from 2012 (Polarcus survey) brightens with hydrocarbon-filled sand. However, the seismic response of the hydrocarbon interval is generally tuned (overestimates hydrocarbon thickness) and does not discriminate the proportion of oil and gas. The pilot hole confirmed a hydrocarbon filled to base untapped accumulation. The UDR inversion and the LWD logging acquired from the producer provided a detailed image of top reservoir, base reservoir, current gas-oil and oil-water contacts and overall confirmed the interpretation, detuning and stretching approach of the seismic data.

### DEVEX 2025

#### **TECHBYTES**

### Are you a Reservoir Engineer? Come and join the Investigator fan club.

Gonzalo Notivol Lázaro, Senior Key Account Manager (UKA), Cegal.

This year, Cegal releases new software functionality supporting data and statistical analysis for production and reservoir engineering in the Petrel E&P Software Platform\*. We have built a brand-new time series window that enables production analysis and forecasting on top of the existing data visualisation capabilities.

Over the last 15 years Cegal has aided comprehensive and efficient subsurface data analysis fully integrated into the Petrel E&P Platform through the Blueback Investigator plugin. Since its origin, the tool has continuously grown its user base across subsurface specialists due to its flexibility, integration, ease of use, and domain support.

Honouring its origins, Investigator continues to focus on the efficiency of the workflows and their repeatability, bringing down the time spent preparing laborious production reports. With the new features, we can automate the process without exiting Petrel, generating a full presentation with 150+ wells and 30+ years of production data in less than 10 minutes, with over 600 plots consistently displayed across all wells.

\* Petrel E&P Software Platform is a trademark of SLB.

### Behind-Casing Fluid Typing Using Ultrasonic Logs for Plug and Abandonment Applications: Enhancing Efficiency

Alhadi Zahmuwl<sup>1</sup>, <sup>2</sup> Robert Webber<sup>2</sup>, Charles Desmazures,<sup>3</sup>

<sup>1</sup>slb, aberdeen, United Kingdom. <sup>2</sup>CNOOC, Uxbridge, United Kingdom. <sup>3</sup>CNOOC, aberdeen, United Kingdom

Ultrasonic imaging tools, traditionally used for cement bond evaluation and pipe condition assessment, are now become essential in plug and abandonment operations for characterizing fluids behind casing. Annular drilling fluids degrade over time, with heavier components settling and lighter fluids rising. Integrity issues or poor cementing can also lead to hydrocarbon migration into the annulus, complicating casing recovery operations.

In this North Sea offshore case, a platform well has integrity challenges and required P&A. Determining whether the 10 3/4in annulus contained hydrocarbons was critical because the platform could not handle recovered crude. Any unintentional circulation of hydrocarbons would risk delays, operational complexities, and a possible platform shutdown.

Advanced ultrasonic tools utilizing flexural attenuation, Third Interface Echo (TIE), and pseudo-density measurements enabled precise characterization of the annular fluid. Log results identified gas at the top, followed by water and OBM, aligning with actual circulation findings.

This analysis avoided the need to mobilize a well test package, reducing logistics, deck space demands, and costs. Without this solution, preemptive mobilization of the test spread would have increased operational challenges and uncertainties, potentially leading to a platform shutdown. The innovative approach enhanced efficiency and minimized risks during the P&A operation.

### Additional Perforations in the Pentland formation – High Uncertainty Led to High Case Gains

Jane Davidson

TotalEnergies, Aberdeen, United Kingdom

Culzean came off plateau in 2023 meaning there is spare production capacity and production optimisation operations are underway to increase production. From field start up 5 of 6 wells produce from the Triassic age Skagerrak Formation, with a single well producing from the overlying Jurassic age Pentland Formation. All the wells producing from the Skagerrak Formation have Pentland Formation sands behind casing and this was identified as an additional perforation target, the first of which was performed in 2024 in C6. The outcome of this operation was uncertain but of potentially high value: a high differential depletion meant there was a risk of formation damage to the existing perforations; and the volume of connected gas in the Pentland Formation was highly uncertain because the Pentland Formation heterogeneities that could lead to compartmentalisation.

The results of the perforation are at the high end of expectation with initial gains of 15kboe/d and a low production decline rate. Significant crossflow was confirmed, but with no significant formation damage to the Triassic perforations in C6. The estimated connected volume is at the upper end of pre operation estimations. These results have derisked future add perforation opportunities across the field.

### Power-Efficient Pump Optimisation and Production Assurance: Reducing Power Demand and Carbon Emissions while Maintaining Production.

Gerald Ihedilionye, Hope Okhuoya EnQuest, Aberdeen, United Kingdom

Facility optimisation is crucial in mature fields needing to minimise carbon footprint while maintaining optimal and economic production levels. In this presentation, an operational case study will be discussed highlighting a unique field case where further investigation into topsides processes and current production well conditions revealed an opportunity to further optimise topsides pump operations while maintaining production assurance

In this mature field, low associated gas production volumes are insufficient to satisfy total plant power demand, hence requiring diesel-powered generators. These generators primarily power topside pumps which operate at high pressures for water injection and artificial lift, thus requiring significant power demand which ultimately drives up carbon emissions.

The presentation will describe the operational workflow used for this case, including opportunity identification, production and operational parameter evaluation, and the implementation of new pump operating conditions. The application of this strategy led to a reduction of the facility's overall power consumption, and by extension, a decrease in associated carbon emissions. The strategy can be re-applied to other oil and gas facilities to drive cost savings and more sustainable operations.



Reinstating production from an HPHT extended reach gas-condensate well following a complete wellbore scale blockage and managing subsequent production, Jade

Steven Bolton<sup>1</sup>, David McLaughlin<sup>1</sup>, Marcos Monteferrante<sup>1</sup>, Gary Cooper<sup>1</sup>, Christopher Harper<sup>2</sup>

<sup>1</sup>Harbour Energy, Aberdeen, United Kingdom. <sup>2</sup>Baker Hughes, Aberdeen, United Kingdom

Jade producing well J13 experienced a rapid decline in productivity leading to a complete loss of communication with the reservoir. A systematic approach was employed to diagnose and remediate the well, returning it to production in a short space of time. Non-invasive techniques and wireline were used to diagnose the issue, with a rig conveyed coiled tubing intervention being required to carry out the remediation stage of the workscope.

J13 is an extended reach HPHT gas condensate well with a total measured depth of 24,950ft MD. The large step out and extreme temperatures meant the investigation and remediation were technically challenging, particularly as Jade is a normally unmanned platform. During the remediation stage, a repeated equipment failure was experienced, underscoring the challenges intervening in extended reach HPHT wells. Due to the equipment failure, the full remediation scope could not be completed, and the well must now be produced in a tight operating envelope to prevent the issue reoccurring, while routinely chemically treating the well to remove scale deposits.

#### Wireless Control And Monitoring; The Next Generation Downhole Completions

BP - TBC BP - TBC, Rita Greiss, David Eze SPE, Aberdeen, United Kingdom

This paper introduces and discusses with case studies across UKCS and NW Europe a ground-breaking wireless downhole communication and control technology that enables real-time monitoring, autonomy, and remote intervention without the need for cables. Designed for retrofitting existing well completions, the technology has been successfully deployed in three key applications: remediating failed safety valves, restoring downhole monitoring, and enabling interval-based flow control.

Field deployments across five wells have validated the long-term reliability and feasibility of this system. The intelligent safety valve, API 14A qualified, autonomously restored production in oil and gas wells under diverse conditions, including gas lift and slug production. The intelligent control valve achieved zonal isolation in a subsea well without intervention, while the wireless gauge provided continuous pressure and temperature data, replacing failed downhole sensors.

Using pressure perturbations in production fluids for two-way communication, this system eliminates the need for repeaters and allows interaction with multiple downhole devices, independent of depth. Compared to traditional recompletions, this retrofit technology has significantly reduced costs and CO2 emissions to aid in achieving net zero targets, whilst improving operational efficiency. This paper presents the first widespread application of this innovative wireless technology, showcasing its potential to address critical industry challenges.

### Geomodelling to reassess the role of geological heterogeneity in CO2 Storage: Implications for composite systems and long-term containment

Marcus Duffy, Sorin Sirbu
Rock Flow Dynamics, Aberdeen, United Kingdom

This study investigates the role of heterogeneity in geological carbon storage, focusing on geological variables that influence the vertical migration of CO2 plumes. The research aims to reassess the necessity of thick primary seals for preventing CO2 leakage and ensuring long-term storage stability. Traditional petroleum seals which are typically, thick, laterally extensive, and impermeable, have been widely used in carbon sequestration projects. However, these seals may not be essential for CO2 storage due to differences in timescales, fluid characteristics, volumes, and the associated capillary pressure thresholds.

Building on the concept of composite confining systems—defined as multi-layer stratigraphic systems with discontinuous barriers—this study evaluates how factors such as barrier frequency, capillary pressure contrast, and permeability influence CO2 migration. Synthetic box models, 3D static and dynamic models, and uncertainty analyses were used to assess a range of geological properties. The findings suggest that composite systems, which rely on migration-assisted trapping, can effectively arrest vertical migration of industrial-scale CO2 volumes within tens of meters of stratigraphic sections. However, risks such as CO2 bypassing through legacy wells or faults remain critical concerns. These results provide essential insights for optimizing CO2 storage in diverse geological formations.



### Morecambe Net Zero (MNZ) Integrated Field Modelling Study

Akkassin Abdullayev<sup>1</sup>, Alastair Baillie<sup>2</sup>

<sup>1</sup>Spirit Energy, Aberdeen, United Kingdom. <sup>2</sup>Engineering Insights Ltd, Aberdeen, United Kingdom

Spirit Energy operates carbon storage licence CS010 covering the South Morecambe and North Morecambe depleted gas fields, which have a combined theoretical CO2 storage capacity of 1 Gt.

In order to support pre-FEED studies, Spirit Energy have used Integrated Production Modelling to optimise well design and operational parameters for CO2 injection into the South Morecambe reservoir. The study assessed sensitivities for well count, completion design and operating parameters for stable CO2 injection.

CO2 injection well models were evaluated for 9 5/8" and 7" tubing configurations against erosional velocity limits. Lower wellhead pressures in early time lead to higher in-situ tubing velocities due to gas expansion, and injection rates can be increased as reservoir pressure rises.

For an injection rate of 466.2 MMscfd (9 MTPA equivalent), simulations support a field development with six wells, at least one of which should be a 9 5/8" monobore. The remaining wells should be either 7" monobore or 9 5/8" with a 7" SSSV. Surface modelling shows that at no point does the CO2 fluid enter the liquid phase during steady-state flow.

Further project optimisation and design will be achieved by coupled IPM and Reservoir modelling as part of Spirit Energy's 2025 work program.

### Third Time's a Charm, the NW Seymour Production Well Story

Alex Thatcher, Peter Wood, Jamie Hilton Harbour Energy, Aberdeen, United Kingdom

The recent development drilling in the NW Seymour Field marks a significant milestone in Harbour Energy's efforts to extend the productive life of the Armada platform

The field was discovered in 2004, it has a Middle Jurassic oil filled reservoir. The discovery well was suspended following a DST which demonstrated the field's productivity. Production started in 2006 via a subsea tie-back of the original exploration well, but performance was underwhelming, raising early questions about the reservoir's productivity. In 2011, this well was replaced with a new horizontal producer to improve output, but this well also failed to deliver as expected. The poor results posed a critical question: was the issue with the reservoir quality or the well design itself?

Pressure transient analysis (PTA) played a vital role in addressing this question. PTA helped diagnose the well's performance over time and identified a progressive impairment trend, though it confirmed that the reservoir demonstrated adequate permeability on a gross scale. This insight suggested that by side-tracking the existing well 50m away would lead to higher rates.

In Q2 2024, Harbour Energy sidetracked the horizontal well. The new well's results have been promising, and production rates are far in excess of previous wells.

### Sanctioning 5 Late-Life Infills on Mungo: Combining individual probabilistic subsurface outcomes into a single portfolio assessment for better predictability.

Benjamin Twigger, Rufat Faiq Huseynov, Thomas Harpley bp, Aberdeen, United Kingdom

Getting approval to drill a late-life oilfield infill campaign is a challenge for many reasons. One is the difficultly in accurately predicting rate and reserves given the smaller target sizes and greater risks and inter-dependencies, with a poor track record on many fields. This talk describes how an innovate probabilistic method was used to combine 5 infill well targets, each with a large degree of uncertainty and inter-dependencies, into a portfolio for sanction. It details how appropriate downside, reference and upside resource cases were chosen and modelled for the FM that communicated and considered the incremental value, uncertainties, risks, and dependencies effectively. The same methodology can be used for any portfolio of options where there are significant risks and uncertainties. Advantages of this method include: Full range of resources and resource scenarios represented; Robust probabilistic analyses and reliable outcome predictability; Quicker and less liable to make errors, due to reduced number of inputs needed compared to deterministic scenario approach; Objective choice of portfolio reference case, less prone to bias; Clear audit trail with probabilistic analyses stored in central database.

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"Devex is a fantastic conference, for decades it has been promoting the sharing of lessons learned right across the upstream subsurface value chain. The conference is very well aligned with Equinor's key values of "Open & Collaborative" and as such we are delighted to support it again in 2025. We look forward to presenting some of our own lessons learned but also engaging with other professionals in what is sure to be another fantastic conference"

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Our aim is to advance, for the public benefit, education in the scientific and technical aspects of subsurface energy and related technologies.

We welcome all who work in subsurface energy related fields and are keen to explore the exciting technologies that continue to develop across the sector.

Though careers in 'energy' are constantly evolving, the GESGB aims to be relevant, useful, and beneficial to members at every stage of their careers within the energy industry.

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