International Association of Oil & Gas Producers

Introduction into IOGP's Wells Expert Committee (WEC)

Diana Khatun

IWCF Well Control Workshop

22nd November 2023

About IOGP

We are the global voice of our industry

We bring the industry together

We drive good practices

We serve stakeholders around the globe as go-to experts

We speak on behalf of a global membership

IOGP has 93 Members (as of November 2023)

Companies

- ADDAX PETROLEUM
- ADNOC
- AkerBP
- APA Corporation
- aramco
- ASSALA ENERGY
- Atlantic
- AZULE ENERGY
- Bapco energies
- Basrah Gas Company
- beach
- bp
- BRUNEI
- BW ENERGY
- Capricorn
- CC ENERGY DEVELOPMENT
- cenovus ENERGY
- CEPSA
- CHEIRON
- Chevron
- CNOOC
- ConocoPhillips
- Crescent Petroleum
- DANA GAS
- DOLPHIN ENERGY
- Dragon Oil
- EGPC
- eni
- equinor
- ExxonMobil
- Genel Energy
- GKP GULF KEYSTONE PETROLEUM
- Harbour Energy
- HESS
- INPEX INPEX CORPORATION
- КазМунайГаз
- KOSMOS ENERGY
- Kuwait Oil Company
- MOLGROUP
- NCOC NORTH CASPIAN OPERATING COMPANY
- NEPTUNE ENERGY
- North Oil Company
- OMV
- ONGC
- ORLEN
- OXY
- Pan American ENERGY
- Petroleum Development Oman
- PERTAMINA HULU ENERGI
- BR PETROBRAS
- PETRONAS
- pluspetrol
- PRIME ENERGY
- PTTEP
- QatarEnergy
- QATARGAS
- REPSOL
- Shell
- SOCAR
- Sonangol
- SPIRIT ENERGY
- SUNCOR
- TotalEnergies
- TRIDENT ENERGY
- TULLOW plc
- vår energi
- wintershall dea
- Woodside Energy
- YPF

Associations

- API American Petroleum Institute
- arpel ASSOCIATION OF OIL, GAS AND RENEWABLE ENERGY COMPANIES OF LATIN AMERICA AND THE CARIBBEAN
- australian energy producers
- BVEG Bundesverband Erdgas, Erdöl und Geoenergie e.V.
- CAPP CANADIAN ASSOCIATION OF PETROLEUM PRODUCERS
- Element nl
- ENERGEO ALLIANCE
- energy institute
- HeliOffshore Safety Through Collaboration
- IADC
- ibp INSTITUTO BRASILEIRO DE PETRÓLEO E GÁS
- ipieca
- OEUK OFFSHORE ENERGIES UK
- OFFSHORE NORGE

Associate Members

- AkerSolutions
- AKT
- Baker Hughes
- christof industries
- DNV
- OPITO
- SAIPEM
- SBM OFFSHORE
- slb
- TechnipFMC

The areas we are working on

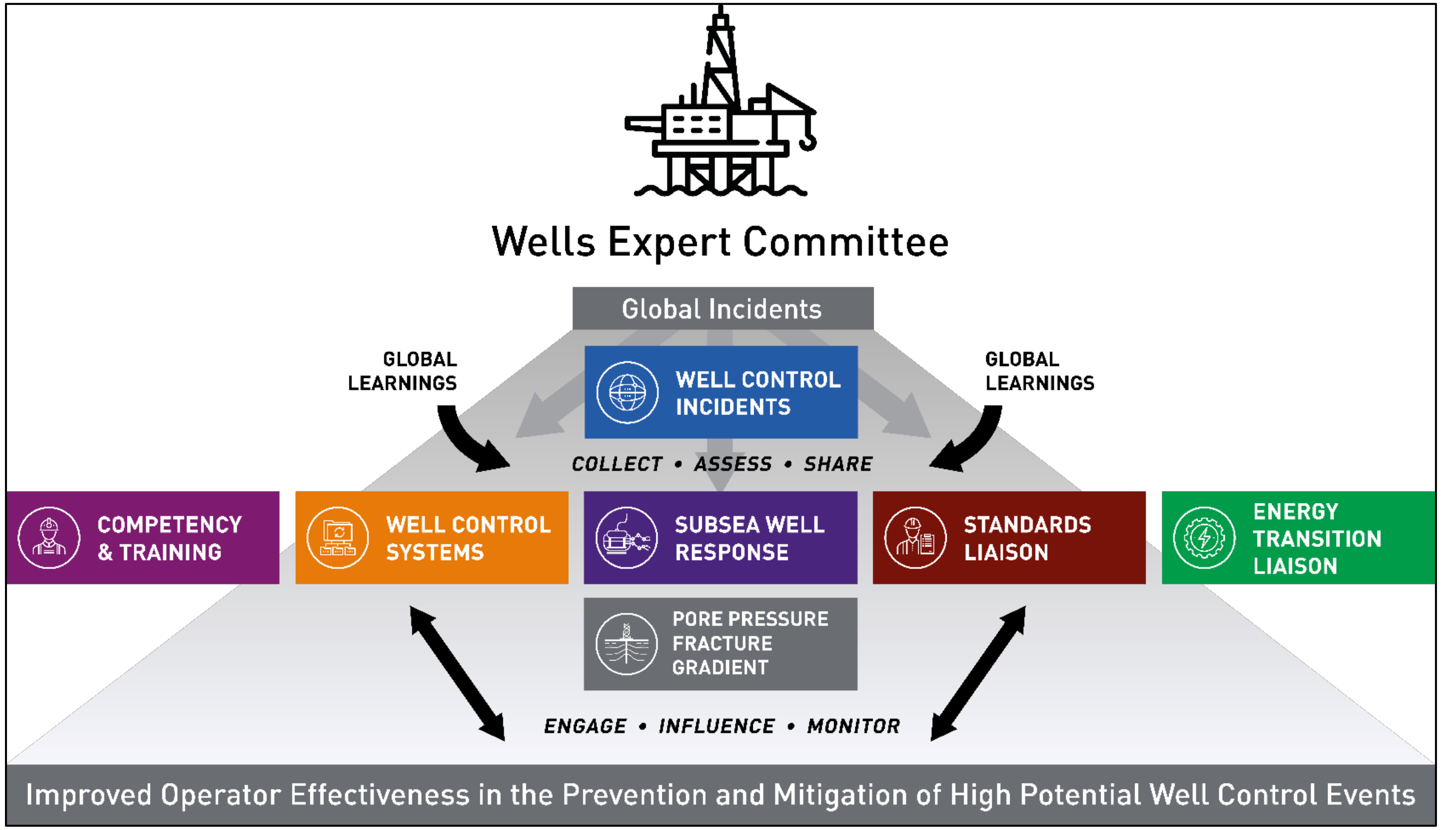
- **Technical**
  - We work to develop and disseminate best practice in safety, environment, engineering.
  - This includes, among others, health, geomatics, metocean, decommissioning and well control.
- **Advocacy**
  - From our London, Brussels and Houston offices, we address a variety of stakeholders global and regional bodies as well as the broader public.

Global Industry Response Group (GIRG)

- In 2010, IOGP established a Global Industry Response Group (GIRG) to ensure that the lessons learned from that year's deep water Gulf of Mexico incident and other similar well control event were widely absorbed and applied.
- The GIRG worked closely with international oil companies, national oil industry associations, regulators and other government agencies to improve the safety and sustainability of deep water operations around the world.

Wells Expert Committee (WEC)

The purpose of the Wells Expert Committee (WEC) is to improve well Operators' effectiveness in the prevention and mitigation of high consequence well control events throughout the well life cycle, but particularly during well construction and well work, recognizing that such events pose the highest global risk to safety, to the environment, and to the industry's license to operate



WEC Leadership

Wells Expert Committee

CHAIR:
Paul Forman
(bp)

VICE-CHAIR:
Alexandre Depiesse
(TotalEnergies)

WELL CONTROL INCIDENTS

CHAIR:
Andrew Parkinson
(Shell)

VICE-CHAIR:
Dean Terrien
(CNOOC)

WELL CONTROL SYSTEMS

CHAIR:
Matthew Tenny
(ExxonMobil)

VICE-CHAIR:
Gabriel da Silva Felipe
(Petrobras)

STANDARDS LIAISON

CHAIR:
Jonathan Harker
(bp)

PORE PRESSURE FRACTURE GRADIENT

CHAIR:
Fernando Ziegler
(Chevron)

VICE-CHAIR:
Kun Su
(TotalEnergies)

COMPETENCY & TRAINING

CHAIR:
David Lobell
(bp)

SUBSEA WELL RESPONSE

CHAIR:
Mauricio Baez
(TotalEnergies)

VICE-CHAIR:
Andrés Cruz Vélez
(ExxonMobil)

ENERGY TRANSITION LIAISON

CHAIR:
Jim Powers
(Chevron)

Well Control Incidents Subcommittee

The purpose of the Well Control Incidents Subcommittee is to collect, assess and share global well control incidents and learnings of continuously improving quality from IOGP members in order to prevent reoccurrence of such events.

Well Control Incidents Subcommittee – The Process

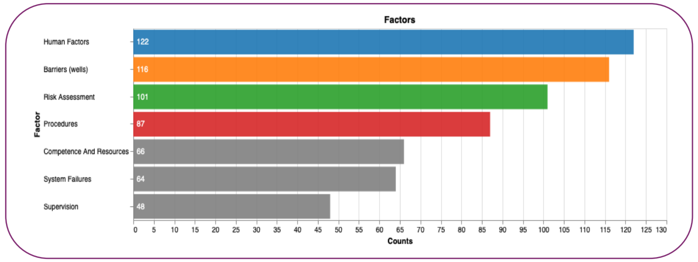
IOGP Annual Safety Reporting

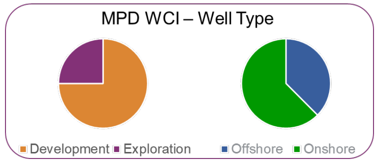
Well Control Incident Database

WCI Sharing Workshops

WELL CONTROL INCIDENTS

1. WEC Focus Areas





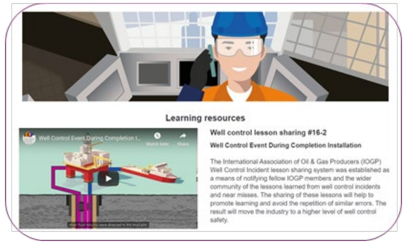
Human Factors

PPFG / Subsurface

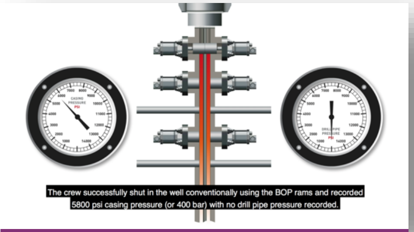
MOC & Risk Assessment

MPD (Technology Application)

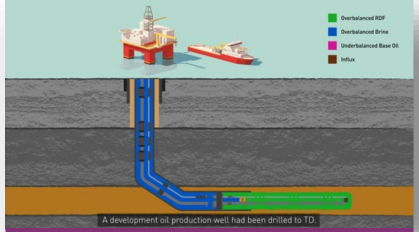
2. Share Learnings



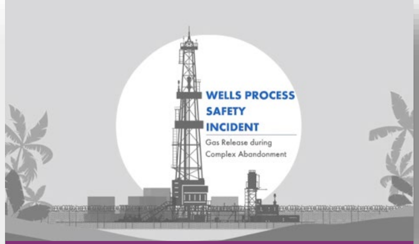
Well Control Incidents Subcommittee



WCI Alert 16-1 video



WCI Alert 16-2 video



WCI Alert 21-4 video

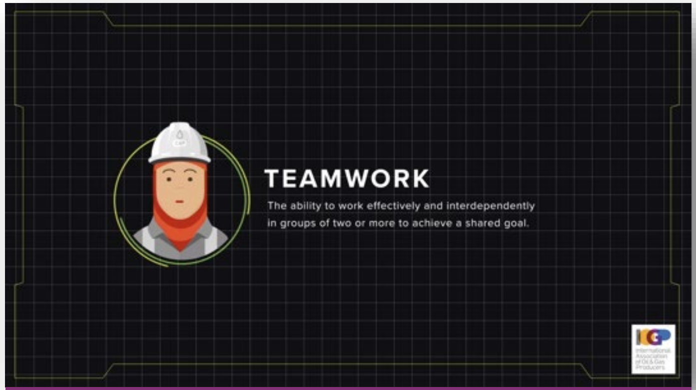
Well Competency & Training Subcommittee

The purpose of the Competency and Training Subcommittee is to minimize the impact of global well control events due to operations-related human error.

This involves providing individuals and operations teams in our industry the leadership and guidance to assure development and verification of technical and non-technical competency, including human behaviours.

Well Competency & Training Subcommittee

Weak Signals video

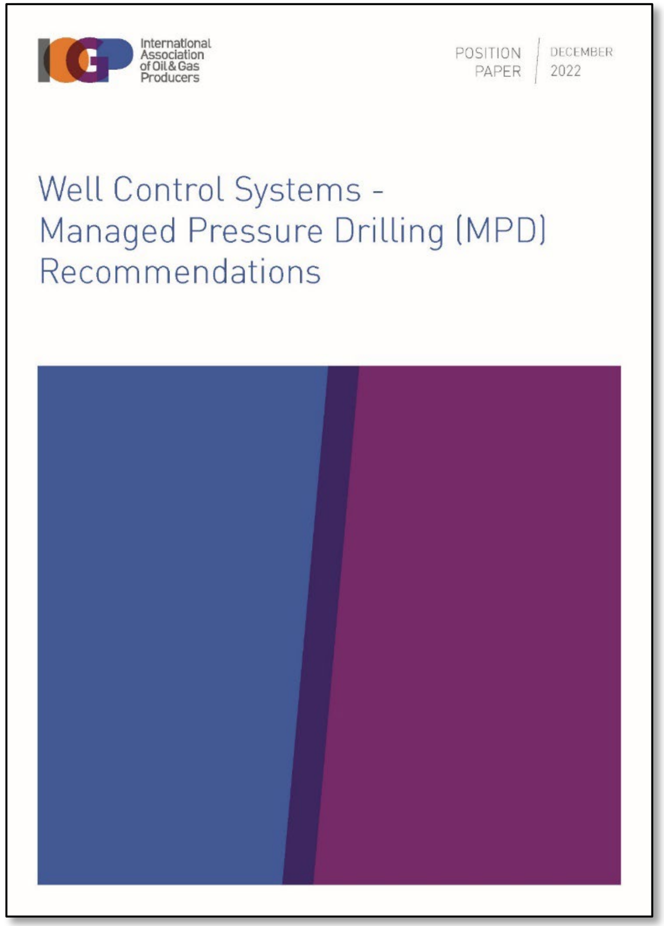


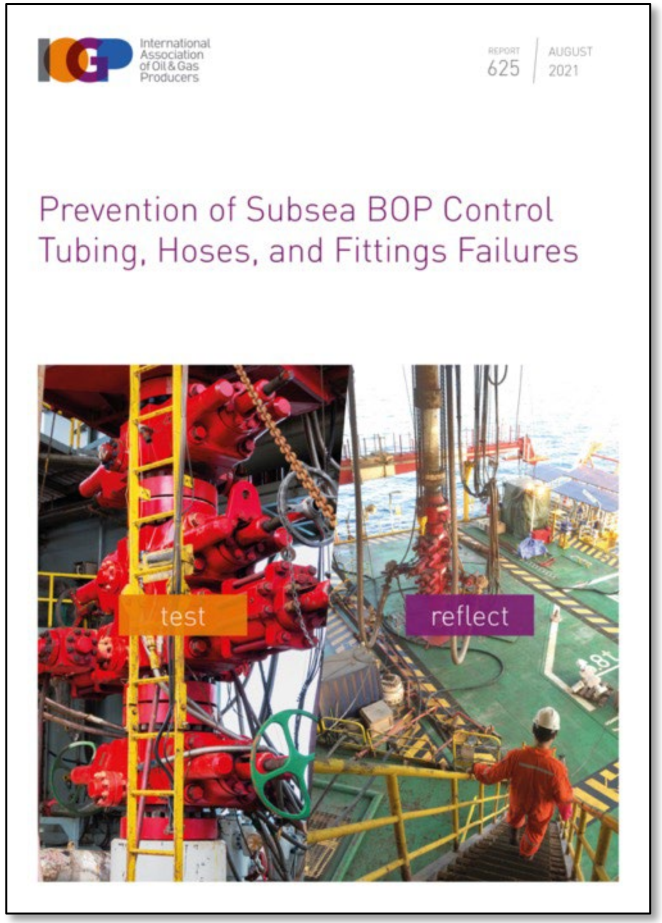
Human Factors videos

Well Control Systems Subcommittee

The purpose of the Well Control Control Subcommittee is to assists industry in the prevention of high consequence well control events, recognizing that such events pose the highest societal risk on a drilling or work over rig.

Well Control Systems Subcommittee

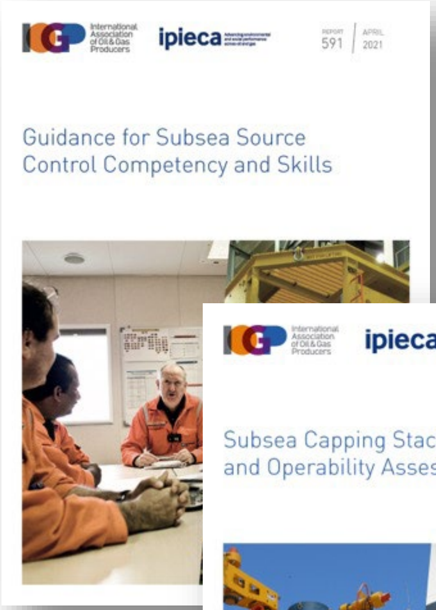




Subsea Well Response & Source Control Subcommittee

The purpose of the Subsea Well Response & Source Control Subcommittee is to support the industry in planning and use of subsea well response and source control equipment and associated activities and services, centred around risk based and balanced approaches.

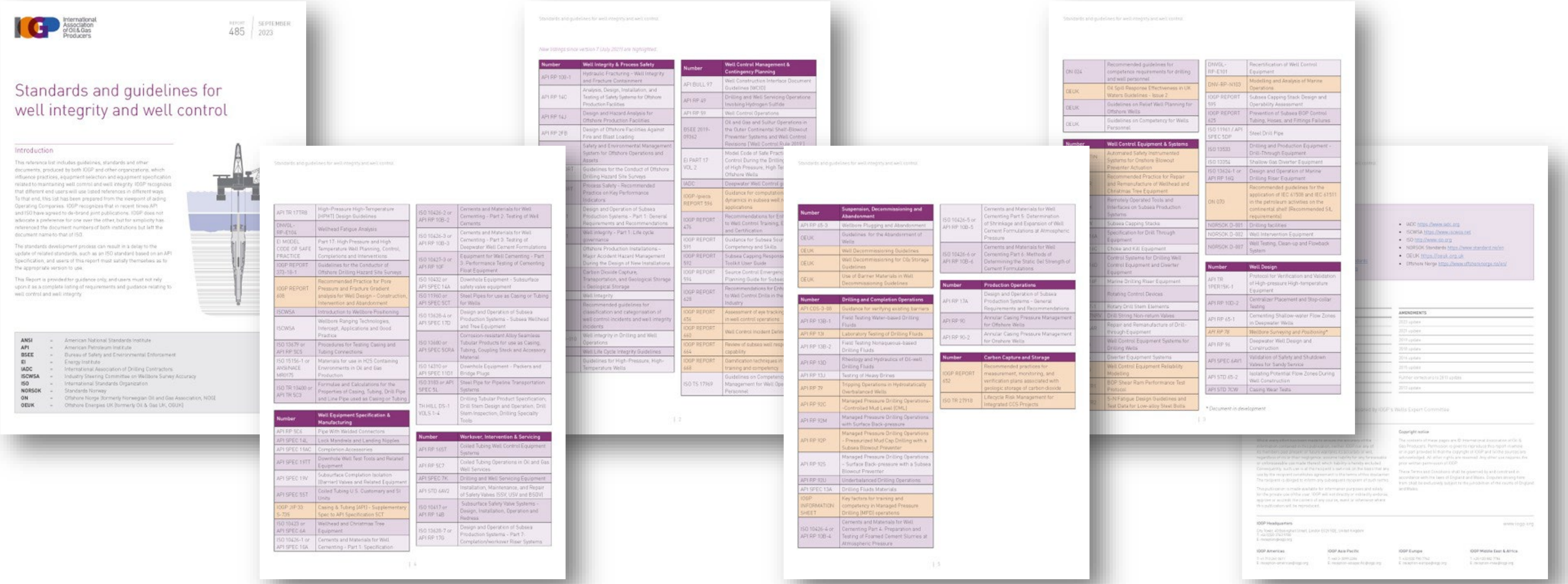
Subsea Well Response & Source Control – Resources



Well Standards Liasion

The purpose of the Well Standards Liasion is to monitors the development of critical well control and well integrity standards that can be utilized to prevent high consequence well control and/or well integrity incidents.

Well Standards Liasion



Pore Pressure Fracture Gradient Expert Group

The purpose of the Pore Pressure Fracture Gradient is to develop an industry guidance document to describe the Well Control Hazard (Hydrocarbons Under Pressure) and through that help harmonize approaches to this critical task in the Well Control bow tie.

Pore Pressure Fracture Gradient Task Force

WELL CONTROL INCIDENT LESSON SHARING

<<< Back to Results

Printable version

Misunderstood pore pressure, lack of vigilance and empowerment cause Well Control Incident.

Drilling 6" hole - just entering an identified reservoir - with 1.40SG mud weight (MW). The formation pressure expected was not well understood and a large uncertainty remained between a depleted reservoir scenario or a pressurized case (water injection on a mature field).

On the first stand into the reservoir, a circulation was performed in order to assess the gas level and the stability of the well, a maximum of 7% was observed. No flowcheck performed but a conclusion was made on a depleted scenario case. A drill pipe (DP) connection was then performed to continue drilling. 7m^3 of gain were taken during the connection without been noticed. Drilling was resumed for a few more metres and significant flow increase & gain in active system was observed.

Drilling was stopped but the well was not shut in immediately. It took 5 more minutes to investigate the anomaly.

Shut in drill pipe pressure (SIDP) 450psi - shut-in casing pressure (SICP) 1160psi - 25m^3 total estimated gain.

Significant gain volume generated serious difficulties to control the well.

Well was finally killed using driller's method with kill mud weight (KMW) 1.64SG.

What Went Wrong?:

Misunderstanding of the pore pressure prediction (high uncertainty expected between 0.98 to 1.51SG).

Wrong pore pressure diagnosis while based on non-valid gas criteria - the gas% criteria was not a pump-off event.

No flowcheck performed and anticipated in the drilling strategy to enter that reservoir.

Lack of crew vigilance, poor well monitoring during DP connections - first kick during connection not identified.

Basic well control procedure not properly implemented for kick detection and well shut-in. Driller not empowered to shut the well in without authorization.

WELL CONTROL INCIDENT LESSON SHARING

<<< Back to Results

Printable version

Subsurface uncertainties, unfamiliar technologies and shallow water flows in a subsea exploration well

During the drilling of top-hole sections on a subsea exploration well, a series of water flows were encountered.

A number of lessons were identified relating to subsurface uncertainties, well planning, and the detection of well flow, whilst operating with a mud recovery system during riserless drilling operations:

1) The importance of understanding and planning for subsurface uncertainties in well operations.

2) Risks associated with the implementation of new technologies in well operations, including the management of risks with crew's knowledge, skills and ability.

The Wells Expert Committee/Well Control Incident Subcommittee believes that this incident description contains sufficient lessons to be shared with the industry. We further encourage the recipients of this mail to share it further within their organization.

The top-hole section was drilled to TD with seawater and sweeps prior to displacing to 1.32sg (11ppg) mud. A shallow water flow was encountered during the trip-out but the well was killed using a number of heavy pills up to 1.60sg (13.3ppg). Due to concerns about the hole conditions the decision was taken to abandon the hole section and re-spud the well.

Drilling the drilling of the new top-hole section a similar mud weight of 1.32sg (11ppg) was used but with a revised plan for a shallower section depth. However, before the revised section depth was reached an unexpected flow was detected. It was necessary to increase mud weight first to 1.38sg (11.5ppg) and then to 1.47sg (12.2) prior to pulling out of the hole. A decision was then made to change the 28" liner casing depth.

Shortly after drilling out the liner with a 1.43sg (11.9ppg), a mud shallow water flows was encountered. Attempt to kill the well with a 1.51sg (12.6ppg) mud was unsuccessful. Eventually, the flow was controlled with 1.55sg (12.9ppg) mud but with slight losses occurring.

International Regulators' Forum
GLOBAL OFFSHORE SAFETY

Title: Well Integrity: Prevention of Well Control Incidents, the case for industry guidelines

Problem Statement:

Much industry collective effort has gone into defining responses to deal with any loss of well control situation. Recent data and incidents provide a view that a deeper understanding of the underlying hazards and how industry designs for them is worthy of collective action. This will strengthen industry focus towards the Left Hand Side of the "Loss of Well Control" bow tie and thus reduce the likelihood of any loss of well control events taking place. The planned efforts can be split in three broad areas:
1) Well design "inputs" (pore pressure/fracture gradients/geological risks).
2) translation of 1) into efficient and safe well designs
3) definition of safe operating envelopes for Wells activities in the operations and production phases.
It is recognized that -whilst some areas like pore pressure/fracture gradient prediction has no universally accepted industry guidelines- in other areas guidance does exist. As such, this effort will likely need some development of new guidance but also target implementation of existing guidance.

The changes we expect to see:

- Systematic industry approach to pore pressure/fracture gradient prediction, likely through the development and adoption of new industry baseline guidance.
- Systematic work flows and key technical elements required for translating any new pore pressure/fracture gradient guideline into efficient and safe well designs, likely through development and implementation of new industry baseline guidance.
- Systematic implementation of existing relevant guidance on safe well operating envelopes.

Industry Association(s) invited to lead the change / develop the solution:

- International Association of Oil and Gas Producers (IOGP) / International Association of Drilling Contractors (IADC)

Key performance indicators:

- Development of industry wide standards or guidelines.
- IRF/IOGP collaboration on selection of targeted guidance for shared implementation focus.
- Reduced likelihood of well control incidents.

Contact: NOPSEMA (Australia) Date: 05 July 2021
Endorsed by IRF Management Committee

International Association of Oil & Gas Producers

REPORT 608 | JULY 2022

Recommended practice for pore pressure and fracture gradient analysis for well design – construction, intervention, and abandonment

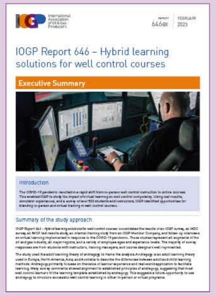
International Association of Oil & Gas Producers

WEC Deliverables 2023

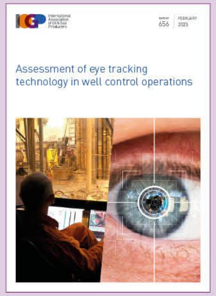
PUBLISHED DOCUMENTS

IOGP Report 476
Recommendations for enhancements to well control training, examination and certification

IOGP Report 485
Standards and guidelines for well integrity and well control



IOGP Report 646ex
Hybrid learning solutions for well control courses – Executive Summary



IOGP Report 656
Assessment of eye tracking technology in well control operations

IOGP Report 660
Well Control Incident Definitions

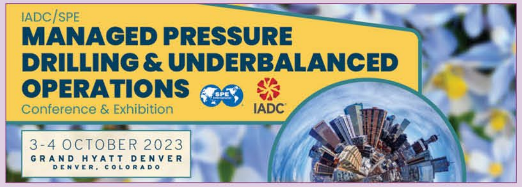
IOGP Report 668
Gamification techniques in well control training and competency

WORKSHOPS

Offshore Oil & Gas Environment and Safety Workshop
14-16 June 2023, Suriname

CONFERENCES

IADC Well Control Conference of the Americas & Exhibition
22-23 August 2023, New Orleans



IADC/SPE Managed Pressure Drilling & Underbalanced Operations Conference & Exhibition
3-4 October 2023, Denver

IWCF Annual General Meeting & Well Control Workshop
22-23 November 2023, Azerbaijan

WCI ALERTS

10 Published Alerts

Key Takeaways

Wells Expert Committee (WEC)

- WELL CONTROL INCIDENTS
- COMPETENCY & TRAINING
- WELL CONTROL SYSTEMS
- SUBSEA WELL RESPONSE
- STANDARDS LIAISON
- ENERGY TRANSITION LIAISON

The Wells Expert Committee (WEC) will continue to pursue our mission of preventing and mitigating high-impact well control events.

International Association of Oil & Gas Producers

For more information please contact:

Diana Khatun – dk@iogp.org

IOGP Headquarters

City Tower, 40 Basinghall St, London EC2V 5DE, United Kingdom
T: +44 (0)20 3763 9700
E: reception@iogp.org

IOGP Americas

T: +1 713 261 0411
E: reception-americas@iogp.org

IOGP Asia Pacific

T: +60 3-3099 2286
E: reception-asiapacific@iogp.org

IOGP Europe

T: +32 (0)2 790 7762
E: reception-europe@iogp.org

IOGP Middle East & Africa

T: +20 120 882 7784
E: reception-mea@iogp.org

www.iogp.org