



## Well Control Assurance Program (WCAP)

OCT 2020



## Crisis (noun)

*/ˈkrʌɪsɪs/*

noun: crisis; plural noun: crises

1- a time of intense difficulty or danger.

**Similar:**

Catastrophe

Calamity

Cataclysm

Emergency

Disaster

Predicament

Hard Times

2- a time when a difficult or important decision must be made.

**Similar:**

Critical Point

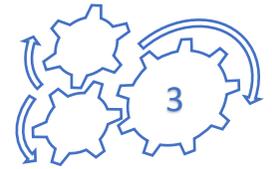
Decisive Point

Turning Point

Crossroads

the turning point of a disease when an important change takes place, indicating either recovery or death.





## Well Control Assurance Program (WCAP)

### Program Definition

Well control events at their worst outset can be fatal, harm people, incur significant asset and wells loss, severely impact organizational reputation, and negatively affect the company finances.

Where a suitable Well Control Assurance Program and further Wellbore Crisis Management planning needs to be initiated and implement long before a well control event begins to arise.

Where although it is tempting to ignore the real and evident hazard/risk facts of conducting well operational management in todays every increasing complex well environments. Negligent preparation and readiness in these areas today can have severe and significant legal, public relations and operating socio and economic consequences if all key issues are not compliantly addressed.



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# Well Control Assurance Program (WCAP)

Well control Assurance Program – 3 P's, Evident elements to measured, managed and controlled throughout each well's drilling and workover life cycles.

## Physical (Parts) Elements

### Well assets

- Well Integrity and design.
- Well examination
- Well control – Rig assurance

### Onshore Rig Installations

- Rig specifications details
- Rig inspections, Audits.
- Complex well assessment.

### Offshore Installations

- Rig specifications details.
- Rig inspections, Audits.
- Complex well assessment.

### Well control equipment / systems

- Blow out preventer assurance.
- Well control equipment and systems Inspections, Audits
- Complex well assessment.

### Routine Engineering Services

### Emergency response/rescue services

## People Elements

### Organizational responsibilities

- Organizational structure.
- Roles and responsibilities
- Organizational learning.

### Technical skills

- WCA Knowledge and experience.
- Project management
- Reporting and Investigative skills

### Competencies

- Practical (loss control) Safety leadership
- Hazard, risk change management.
- IWCF level 4 / 5
- W-CAT basic to advanced, training
- TFC-T Task force commander Training
- WOCRM Crew training.

### Soft skills

- Communications skills
- Coaching mentoring
- Peer support/assists

### Well control specialist services

## Paper Elements

### Company and International Regulations

### International Well Control Standards

### Company Management systems

- Well control HAZID / HAZOP
- Risk assessment
- Reporting & investigation standards.

### Company Safety Management Systems

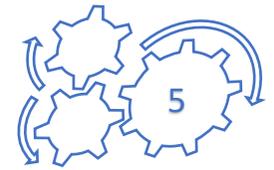
- Emergency response plans
- Crisis management plans
- H2S guidelines
- Well control assurance audits
- Well control reporting, investigating.

### Well Programs

### Well design's and engineering models.

### Well Control Emergency Response Plan

1. Well control manual
2. Bridging documents (project/well basis)
3. Blow out contingency strategy (plans)
4. Relief well strategy (plans)
5. Cap & kill strategy (plans)
6. Oil Spill Planning.



## Well Control Assurance Program (WCAP)

In summary, a well control assurance program 'WCAP' essentially addresses 3 major dependent areas to proactively prevent well control related events, through;

### 1) **Well control assurance Management**

Regulations, Standard & Guidelines

Well control assurance Management, of all Regulations, Standard & Guidelines warranted.

### 2) **Crew Competency Assurance**

Trainings, Workshops & Simulations

Assure that people are competently trained to do their job for any well control event that may arise

### 3) **Quality Management Programs**

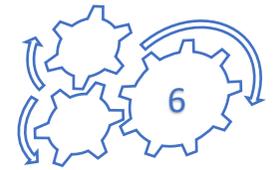
Rig Inspections, Equipment Audits & Monitoring

Quality management programs that address all drilling and workover asserts, plant, equipment, and operating systems work as intended for any well control event.

Addressing all components through a well control assurance program designed to deliver all principles and practices to prevent and eliminate all potential well control causes, effects and consequences.

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# Well Control Assurance Program (WCAP)

## 1. Well control assurance Management

### Regulations, Standard & Guidelines

Standards and regulations have to be defined and implemented in any operator organizational strategy. Well control events can be categorized into 3 tiers of intensity; or better say, 3 tiers of strategies.



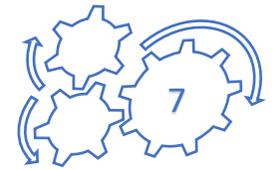
Tier 1 is a well control situation where Standard Operating Procedures (SOPs) exist for recovery to normal operation. IWCF and IADC guidelines, API reports and standards and Organizational Well Control Policies/Manuals will fully cover this tier of events. This level of intensity can be handled by on-site drilling crew and office-based support teams based on mentioned standards.



Tier number 2 is defined as escalated situation of level 1 or initially complicated set of events out of tier one; in this criteria SOPs are not addressed and procedures for recovery to normal should be followed by on-site drilling crew, office-based support, third party (Service) companies and maybe external consultants. On this level of situation, Well Control Emergency Response Plans (WECRPs) and Oil Spill Response Plans (OSRPs) should be activated based on desired level of action and kind of event. These documents will be generated for single wellbores, series of wells or underdevelopment fields before spud and commence of any operation.



And Tier 3 considered as where personnel and facilities are in imminent danger, there is out-of-control-well and surface/underground blowouts are happening. Existing crew, procedures and equipment are not capable to handle the situation anymore and external companies and consultants should take actions. Blowout Contingency Plans (BOCPs), Tier 3 WCERPs and Relief Well Planning (RWP) need to be activated and Blowout Control Task Forces (BCTFs) should be engaged.



# Well Control Assurance Program (WCAP)

## 1.1 What are WECRPs, BOCPPs, SRPs and RWP?

Following documents have been developed for companies in the last three decades, based on their WCAP needs and experiences to purposely serve to prevent escalating well control events. Documents are prepared based on specific wells program or fields specific operating and project needs.

Well Control Emergency Response Plan  
(WCERP)

Tactical plan designed to prevent a major well control event and if needed to transition from reaction (24 h) to the Blowout contingency plan (BCP) intervention.

Blowout Contingency Plan  
(BCP)

Strategic project-oriented plan to intervene after a loss of control occur where both direct wellhead intervention and a relief well(s) are outlined.

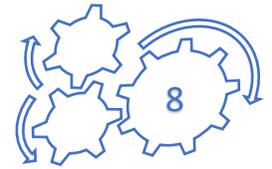
Oil Spill Response Planning  
(OSRP)

Response document to a spill discharge from an offshore or onshore facility.

Relief Well Planning  
(RWP)

Planning, design and execution of a relief well to kill and secure an uncontrolled blowout.

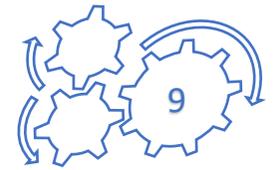
# Well Control Assurance Program (WCAP)



## Integrated Well Control Assurance Program & Crisis Management Services Workflow



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# Well Control Assurance Program (WCAP)

## 2. Crew Competency Assurance

Trainings, Workshops & Simulations

Personnel Training and competency management is an integral component of a WCAP well cap and crisis management strategy. Individual and team-based response aspects must be considered to proactively prevent and if necessary, command and control well control situation and event that can arise. Trainings shall be provided based on asset WCAP level of hazards and risks assessed.

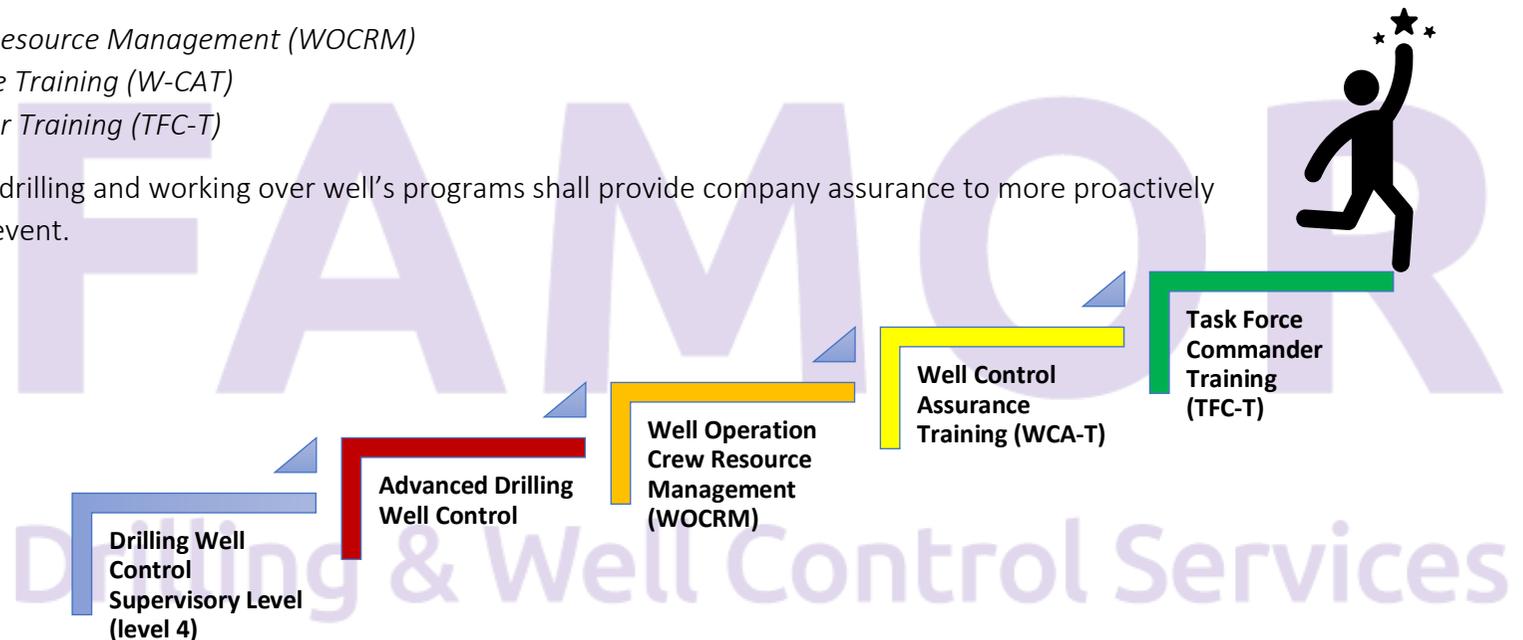
**Frontline people, on-site drilling crew and office-based support teams** must be suitably trained. Typical training modules appropriate for drilling and workover individual and teams are:

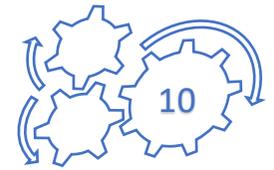
- *Drilling Well Control: Introductory Level (lvl 2)*
- *Drilling Well Control: Driller's Level (lvl 3)*
- *Drilling Well Control: Supervisory Level (lvl 4)*
- *Advanced Drilling Well Control: Level 5*

From a leadership perspective, **drilling supervisors, superintendents, management, specialists and emergency response teams** must fulfill more complex competency checkpoints. The following WCAP training courses are suitably constructed to meet roles and responsibility needs:

- *Well Operation Crew Resource Management (WOCRM)*
- *Well Control Assurance Training (W-CAT)*
- *Task Force Commander Training (TFC-T)*

Completing this training before drilling and working over well's programs shall provide company assurance to more proactively prevent and avoid well control event.





# Well Control Assurance Program (WCAP)

## 3. Quality Management Programs

Rig Inspections, Equipment Audits & Monitoring

Failure of key drilling rig, plant, equipment, and operating systems can result to severely impact drilling and workover operations. Where In a serious well control event all components are placed under more extreme operations conditions. Where far more emphasis must be pace to assure all drilling units plan equipment and systems are capable to meet all operating requirements.



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# Well Control Assurance Program (WCAP)

## Designed For

WCAP course is designed and constructed to raise competence and awareness in current drilling and workover positions as outlined in Table 1.

Personnel Involved	Tier 1	Tier 2	Tier 3
Senior/Night Drilling Supervisor	Directly Involved	Directly Involved	Directly Involved
Drilling Superintendent	Directly Involved	Directly Involved	Directly Involved
"Drilling Contractor" OIM/Rig Manager	Directly Involved	Directly Involved	Directly Involved
"Operator" Drilling Superintended	Directly Involved	Directly Involved	Directly Involved
"Operator" Drilling Manager	Directly Involved	Directly Involved	Directly Involved
Forward Planner	Directly Involved	Directly Involved	Directly Involved
Senior Drilling Engineer & Staff	Directly Involved	Directly Involved	Directly Involved
"Subcontractor" Logistic Manager	Directly Involved	Directly Involved	Directly Involved
"Subcontractor" QHSE Adviser	Only Information	Directly Involved	Directly Involved
"Operator" Operations Manager	Only Information	Only Information	Directly Involved
"Operator" Technical Director	Only Information	Only Information	Directly Involved
"Operator" QHSE Adviser	Only Information	Only Information	Directly Involved
"Subcontractor" Emergency Response Service Center	-	Only Information	Directly Involved
Blowout Control Task Force (BCTF)	-	Only Information	Directly Involved
Governmental Agencies (Iranian Coast Guard, et al)	-	-	Directly Involved

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## Well Control Assurance Program (WCAP)

### Well Control Assurance Training (W-CAT)

#### Overview

W-CAT course is targeted at suitably identified, knowledgeable and experienced drilling and workover well operational and engineering personnel, who may be inexperienced in the latest techniques and technologies for controlling oil and gas tier level 2 and 3, well control events that at a worst outset could result in a uncontrolled blowout.

#### Course Type & Duration

Instructor-led Virtual Experience (ILVE) / 48-60hrs

- Time schedule for this training is in between 8-10 days and it can be tailored as an everyday-training or weekly-program (two, three, ... sessions per week) based on client intention.

#### Course Delivery

The course is delivered through presentation of a series of interactive lectures supported by videos and animations, case studies, group exercises, and discussions. Available case studies from clients should be very helpful to improve training course efficiency.

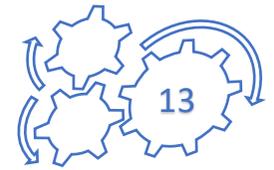
#### Certification

Successful completion of the course will result in Famor Drilling & Well Control E-Cert which is valid for life; **Renewing considerations are going to be issued in further applicable developments.**

#### Entry Requirements

Personnel mentioned in table 1 and any other personnel who are decided to be going to participate based in this training course need to fulfill **Drilling Well Control; Supervisory level (IADC/IWCF level 4) OR Advanced Drilling Well Control (IWCF level 5)**

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## Well Control Assurance Program (WCAP)

### Learning Objectives

The goals and objectives are to comprehend the use of proven principles and practices to regain well control, using the safest, and most efficient methods.

In addition to revisiting (Tier 1) classic kick control methods on day 1, state of the art solutions to resolve (Tier 2 and Tier 3) well control events are covered in days 2,3 and 4 with an optional day for offshore wells in day 5. With the main syllabus focus is out-of-control surface and/or subsurface lithology blowouts.

Participants will acquire a detailed insight into management methods, tools and techniques proven successful to regain control of complex well control situations that escalate to blowout conditions. With a proactive emphasis approach to prevent as opposed to respond, react, and cure events. Participants shall benefit from the instructional compilation of unique and proven well control principles, practices and techniques presented.



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# Well Control Assurance Program (WCAP)

## Initial Training Agenda

This training agenda is prepared as the initial file and based on supposition documents; client desired headlines and guidelines can be added;

### Tier 2/3 Hazards / Risk of blowouts and complete loss of control

- Hazards / Risks associated with Tier 2 events and Tier blowouts
- Conventional well control techniques (Tier 1 events)
- Non-conventional well control techniques (Tier 2 events)
- Blowout (Tier 3 events) (Root causes and effects).

### Tier 3 Blowout, Firefighting, Operational Risks/Impact.

- Firefighting Operations
- Capping Operations
- Snubbing Operations
- Snub in dynamic kill

### W-CAT Management – Tier 3 Events

- Tier 3 Event: Well Control Assurance Management
- Well Control Emergency Response Planning. (Ref Case study)
- Blow-Out Contingency Plans 'BOCP'
- Relief Well Planning. 'RWP'

### W-CAT Management – Tier 3 Events (Continued)

- Capping operations
- Environmental pollution abatement/containment
- Handling toxic gases
- Hot tapping
- Freezing techniques

### W-CAT Offshore and Subsea Wells (Optional)

- Fixed installations (Operators standards, guidelines)
- Mobile offshore drilling units (Operators, industry documents)
- Deepwater Horizon (Macondo well blowout) review
- Subsea wells

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## Well Control Assurance Program (WCAP)

### Task Force Commander Training (TFC-T)

#### Workshop Training

#### Overview

Blowout Task Force Commanders as the main role in crisis control should be enough experienced and competently trained to mitigate consequences and apply different predetermined plans with respect to situation. These people are in charge of crisis team member and other task force members.

#### Course Type & Duration

Instructor-led Virtual Experience (ILVE) / 32-40hrs

- Time schedule for this training is in between 6-8 days and it can be tailored as an everyday-training or weekly-program (two, three, ... sessions per week) based on client intention.

#### Course Delivery

This training course is mostly depended on individual organizational cases; 2-4 scenarios will be designed based on well control and blowout samples or either it can be tailored exactly to client's cases. Group discussions and situational control training will be added to this workshop.

- Also, simulations and software modules are designed for this training; in case of applicability, sessions would be conducted.

#### Certification

Successful completion of the course will result in Famor Drilling & Well Control E-Cert which is valid for life; **Renewing considerations are going to be issued in further applicable developments.**

#### Entry Requirements

Personnel mentioned in table 1 and any other personnel who are decided to be going to participate based in this training course need to fulfill **Drilling Well Control; Supervisory level (IADC/IWCF level 4) OR Advanced Drilling Well Control (IWCF level 5) AND Well Control Assurance Training (WCA-T).**

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## Well Control Assurance Program (WCAP)

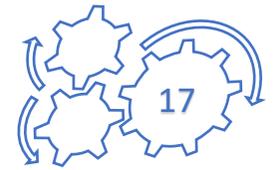
### Learning Objectives

After this training course, Task Force Commander is able to:

- Evaluate size and impact of event
- Arrange teams and clarify job descriptions and responsibilities
- Prioritize must-take-actions and apply most appropriate strategies
- Mobilize equipment, tools and resource
- Lead team members to analyze the situation implement strategies



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# Well Control Assurance Program (WCAP)

## Initial Workshop Workflow

This workflow is prepared as the initial file and based on supposition documents; client desired headlines and guidelines can be added;

### Part 1)

Review WCA-T modules:

- Blowout Control Equipment & Rig Assurance
- Communications skills
- Reporting & investigative skills
- Loss control safety leadership.
- Well Control assurance audits
- WCA Accident / Incident reporting and investigations
- Crisis Management Guidelines
- Well Control Manual.
- Well Control bridging documents.
- Well Control Emergency Response Plan
- Blow out contingency strategy (plans)
- Oil spill contingency strategy (plans)
- Relief well strategy (plans)
- Cap & kill strategy (plans)

### Part 2)

Workshop sessions;

- Sample case studies or Client's cases will be brought as the main real-life cases for following workshop and crisis management team training. Simulator and software will be used to reinforce different workshop aspects.
- Participants will be put in groups and working together as a team in different roles for controlling the mentioned case studies

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# Well Control Assurance Program (WCAP)

## WCAP Standards, References, Guidelines

### Standards

IOPG Rep 485, Standards and Guidelines for Well Integrity and Well control. June 2019

IOPG Report 544 Standardization of barrier definitions, April 2016

IOPG Report 452 Shaping safety culture through safety leadership

DNV-GL Practical Loss Control Leadership

DNV-RP-A203 Qualification of New technology, July 2013

DNV-OS-E101 Drilling Plant, October 2013

NORSOK STANDARD D-010 Well integrity in drilling and well operations. Rev 4 June 2013

NORSOK STANDARD Z-013 Risk and emergency preparedness analysis, Rev. 2, 2001-09-01

### References

Firefighting and Blowout Control L.William Abel. 1994

Advanced Blowout and Well Control, Rober D Grace, 1994

OGP Rep no 434-2 March 2010, Risk assessment, data Directory, Blow out frequencies

DNV-GL Practical Loss Control Leadership (3rd Edition), September 2015

IOPG Rep 510 Operating management system framework, June 2015

IOPG, Worst Discharge Fact Sheet, December 2017

### Guidelines

Oil and Gas UK Guidelines for High-Pressure High Temperature Wells, October 2016

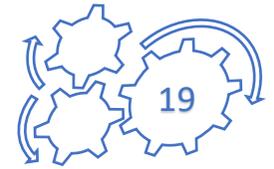
Energy Institute Model code of safe practice Part 17 Volume 2 Well control during the drilling and testing of HPHT offshore wells. 2nd Edition, April 2008

IOPG Info Sheet Sept 2020, Competency Management in well operations

IOPG Info Sheet Sept 2020, Understanding and managing Human Factors in the well's sector



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## Disclaimer

Managing and controlling a well blowout is inherently dangerous work. All material within this course is based on extensive field experience, as used by well control assurance experts with good success. Although instructional and course material is pertinent and accurate. Instructors and persons involved in the development of this course, accept no responsibility for errors, inaccuracies, omissions, or any inconsistency herein. There is also, no guarantee that any given technique, tool, or practice is appropriate for complex conditional, situational well control events that result.

Furthermore, this course cannot cover all complex well eventualities. Where we always advocate that a proactive approach is required to prevent complex well control situations arising. Should events escalate we advise to engage and be advised by experienced, professional, well control assurance specialists. Additionally, this course cannot replicate sound professional judgement or local knowledge and experience. Where safe, best practice, techniques, tools, and procedures as advised by such specialists should be followed and adhered to.

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