

Blue = Notification to PSA according to management regulation
Grey = Alert or Notification to PSA, depending on potential, in accordance with Management Regulations § 29

**Matrix for categorization and classification of well control incidents
 Well intervention operations.**

Degree of seriousness	Well intervention	Guidance
Level 1- Red Critical well control incidents	1. Blowout	1. Blowout to environment or facility. Failure of primary and secondary barriers that can be handled by relief well drilling, capping or handled on the installation.
	2. Failure of primary and secondary barriers	2. Well control equipment damaged from external loads or non-shearable item stuck across BOP and safety head. Well flowing to surroundings. Well killed or well capped on location.
Level 2 – Yellow Serious well control incidents	1. Failure of primary well barrier. Activation of secondary well barrier – no other redundant barrier elements available.	1. Well secured by closing one single valve (safety head or XT valve). String blocking other valves preventing redundant barrier element.
	2. Failure of primary well barrier. Activation of secondary well barrier – other redundant barrier elements available	2. Well secured by closing one single valve (safety head or XT valve). Additional valve(s) available to act as redundant barrier element.
Level 3 – Green Regular well control incidents	1. Temporary reduction of well barrier element function	1. Failure of one well barrier element. Activation of redundant well barrier elements and reestablishment of well barrier element within primary barrier. Secondary barrier intact.
Level 4 – Non-Classified (NC)	1. Very small leak, no activation of BOP necessary.	1. Very small leak, able to pull out of hole and close normal lubricator valves to repair leak. Two barriers intact.
	2. Loss of primary or secondary barrier without influx into the well.	2. Incidents where a barrier is compromised but no influx has occurred.

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Form: [Confirmation of alert/notification to Petroleum Safety Authority](#)

App C Examples of well control incidents

Drilling and Completion

No.	1. Blowout
D1.1 - 01	Blowout where the installation is evacuated and blowout handled from remote location or another vessel (relief well, capping, etc.)

D1.1 - 02	Underground blowout breaching to seabed.
D1.1 - 03	Blowout breaches seabed but well killed from installation
2. High HC influx rate	
D1.2 - 01	High influx volume (significantly above design criteria on kick margin) and shear ram activated, i.e. in ultimate stage.
D1.2 - 02	Shut in pressure exceeding casing burst pressure or well control equipment working pressure whichever is less.
D1.2 - 03	Loss of surface well control components leading to closing of shear seal ram as only option.
D1.2 - 04	Shear seal ram closed due to internal blowout inside drill pipe (failure to close IBOP/install FOSV)
D1.2 - 05	Riser evacuated to surface, loss of primary well barrier. BOP activated and influx contained by secondary barrier, well killed from installation.
3. High-rate Shallow gas flow	
D1.3 - 01	Fixed installation or jack-up where gas blows to installation.
D1.3 - 02	Floater where gas through sea is coming up to the installation.
D1.3 - 03	Gas in such magnitude that instability of rig is experienced
D1.3 - 04	Jack up where gas breaches out on seabed threatening stability of installation
D1.3 - 05	Long term diverting of gas with high potential for failure of diverting system.
D1.3 - 06	Large OD top hole section riser less with gas flowing and unable to kill.
4. High-rate shallow water flow	
D1.4 - 01	Shallow water flow incident under a jack up or a fixed installation - no threat to installation/template
1. Medium HC influx rate	
D2.1 - 01	Medium/high influx volume (above design criteria on kick margin) but kick circulated out using conventional kill method. Note: Also valid for medium/high influx volume in sections designed with infinite kick margin.
D2.1 - 02	Underground blowout not breaching to seabed
2. Total Fluid barrier lost	
D2.2 - 01	Sagging of mud resulting underbalanced situation - (influx volume > kick margin) Handled using conventional kill methods.
D2.2 - 02	Loss situation without being able to maintain the hydrostatic pressure in the well and closure of BOP with pressure underneath.
3. Medium rate Shallow gas flow	
D2.3 - 01	Large OD top hole section riser less with gas flowing and able to kill
D2.3 - 02	Shallow gas diverted on installation.
1. Low HC or water influx rate	
D3.1 - 01	Small HC kick volume (below design criteria on kick margin) handled using conventional kill methods.
D3.1 - 02	Water kick handled using conventional kill methods.
D3.1 - 03	Sagging of mud resulting underbalanced situation - (influx volume < kick margin) Handled using conventional kill methods.
2. Low-rate shallow gas	
D3.2 - 01	Shallow gas incident with kill operations. No gas handled on installation (riser-less operation).
3. Low-rate Shallow water flow	
D3.3 - 01	Shallow water flow incident with no risk for stability of installation.
D3.3 - 02	Shallow water flow left flowing. Re-spud new location.
Non-classified incidents	
D4.1 - 01	Circulation of mud with high drilled gas content with closed BOP as precautionary measure, but without applying additional backpressure.
D4.1 - 02	Circulate and increase mud weight due to increasing gas trend without closing BOP.
D4.1 - 03	Shallow gas bubbles from top hole section.
D4.1 - 04	Released gas after cutting or perforation of casing string - no continuous flow
D4.1 - 05	Released gas after releasing downhole plugs/packers without having an underbalanced situation in the well.
D4.1 - 06	Lost mud returning into wellbore (ballooning).
D4.1 - 07	Release of Nitrogen after a foam cement operation.
D4.1 - 08	Release gas during pulling of cores


D4.2 - 01	Total losses leading to underbalance, but no influx recorded (lost primary barrier, but no influx)
D4.2 - 02	BOP control lost or functions not available (lost secondary barrier, but no influx).
D4.2 - 03	Temporary P&A with failed shallow plug, but deep plug functional (lost secondary barrier, but no influx).
D4.2 - 04	Unplanned LMRP disconnect without permeable zones present (lost primary barrier if no riser margin, but no influx)


Well Intervention

No.	Blowout
I1.1 - 01	Non-shearable item stuck across BOP, leakage above BOP – not able to close any BOP rams – DHSV not available – installation decided to be evacuated.
I1.1 - 02	Well control equipment damaged from external loads – not able to operate equipment – well flowing to surroundings – installation decided to be evacuated.
	Failure of primary and secondary barriers
I1.2 - 01	Non-shearable item stuck across BOP, leakage above BOP – not able to close any BOP rams – DHSV not available – non-essential personnel evacuated - well killed or well capped with assistance from well control service company.
I1.2 - 02	Well control equipment damaged from external loads – not able to operate equipment – well flowing to surroundings – well killed with mud or well capped with assistance from well control service company.
	Failure of primary well barrier. Activation of secondary well barrier – no other redundant barrier elements available
I2.1 - 01	Leak below safety head and well secured by cutting string and close other valves.
I2.1 - 02	Well secured by cutting string using safety head. String blocking other valves (not possible to achieve double block).
	Failure of primary well barrier. Activation of secondary barriers other redundant barrier elements available
I2.2 - 01	Leak between safety head and BOP. Well secured by cutting string using safety head. Other valves available after cutting – double block achieved.
I2.2 - 02	Leak in or above BOP, BOP failed, safety head activated to cut string, valves below closed to provide double block.
	Temporary degraded well barrier element functions
I3.1 - 01	Necessary to close BOP to repair leak above BOP.
I3.1 - 02	Pressure containing stuffing box, grease injection head or strippers redressed to repair leak.
I3.1 - 03	Barrier compromised in well without flow potential.
	Non-classified incidents
NCI - 01	Very small leak, able to pull out of hole and close normal lubricating valves to repair leak. Two barriers intact.

App D Template for one page well control incident presentation

See example below*

<h1>Well control incident</h1>						
Location: <Location> Rig type: <Rig type> Well type: <Well type> Date: <Date>	Well control incident category: <table border="1" style="width: 100%;"><tr><td style="background-color: red; color: white; text-align: center;">Level 1</td><td style="background-color: yellow; text-align: center;">Level 2</td><td style="background-color: green; text-align: center;">Level 3</td><td style="background-color: gray; text-align: center;">None class.</td></tr></table>		Level 1	Level 2	Level 3	None class.
Level 1	Level 2	Level 3	None class.			
Plan: <ul style="list-style-type: none">Description of plan.....		Impact: Lost time, HC release, etc....				
Operation with course of events: <ul style="list-style-type: none">Event description.....		Illustration / Well bore schematic				
Reason for events: <ul style="list-style-type: none">Free text evaluation						
Lessons Learned: <ul style="list-style-type: none">Free text evaluation						
Recommended actions: <ul style="list-style-type: none">Free text evaluation						



Well control incident

Location: <Location> Rig type: <Rig type> Well type: <Well type> Date: <Date>	Critical Issues: • Free text evaluation
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Direct Cause:	Underlying Cause:
Prognosis incorrect	Risk accepted
Shallow gas	Error in program / procedure
Shallow water flow	Procedure not followed
Incorrect mud weight	Lack of competence
Swabbing	Communication error (missing, wrong, incomplete, etc.)
Ballooning	Incorrect use of equipment
HC accumulation below barrier element	Equipment failure
Surface pressure control system failure	BOP failure
Downhole mechanical barrier failure	Other:
Downhole cement / casing barrier failure	
Other:	

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Example of Well control incident category:

*Typical examples:

Medium risk HC influx - Drilling & Completion - (Yellow):

Influx volume (above design criteria for kick margin) but possible to regain barrier with standard kill procedure – To be reported as **D2.1 - 01**.

Temporary reduction of well barrier function – Well Intervention – (Green):

Necessary to close BOP to repair leak above BOP – To be reported as **I3.1 - 01**

App E Categorization and classification matrix for well integrity incidents

**Matrix for categorization and classification of well integrity incidents
For wells in operation / production**


Seriousness level	Grade	Guidance
LEVEL 1 – Red: Critical well integrity incidents with high risk for personnel, environment, and facility	GRADE 1: - Rate > 10 kg/s or amount of > 100 kg HC gas immediate release - Volume > 500 m3 crude	- Barrier failure with major HC release to external environment. - Crossflow with major release to external environment. - Critical threat to installation and personnel. - External leak from well resulting in mobilization of emergency preparedness team.
	GRADE 2: - Rate 1-10 kg/s or amount of 10-100 kg HC gas immediate release - Volume > 50 m3 crude	
LEVEL 2 – Yellow: Serious well integrity incidents	GRADE 1: - Rate 0,1-1 kg/s or amount of 1-10 kg HC gas immediate release - Volume > 1m3 crude oil	- Barrier failure with HC release to external environment. - Crossflow with release to external environment. - Serious threat to installation and personnel. - External leak from well resulting in mobilization of emergency preparedness team.
LEVEL 3 – Green: Medium well integrity incidents	GRADE 1: - Rate 0,006 - 0.1 kg/s or amount < 1kg HC gas immediate release - Volume > 0.01m3 crude oil leak to external environment	- Barrier failure with limited HC release to external environment. - Uncontrolled crossflow between formations due to well barrier failure(s). - Potential threat to installation and personnel.
	GRADE 2: - Dual barrier failure - no loss of containment to external environment.	
LEVEL 4 – Minor well integrity incidents:	GRADE 1: Rate < 0.006 kg/s (API RP14B)	- Negligible threat to installation and personnel
	GRADE 2: Single barrier failure - no loss of containment.	

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App F Template for one page well integrity incident presentation

	<h1>Well Integrity incident</h1>	Well integrity incident category: Level 1 Level 2 Level 3 Level 4
Location: Block xx/xx on NCS Well type: Production / Injection Installation: Platform / Subsea Date: <u>dd.mm.yyyy</u>	<h3>Illustration/well bore schematic</h3>	
Course of events: <ul style="list-style-type: none">Describe in bullet format the course of events		
Critical Issues: <ul style="list-style-type: none">Describe in bullet format the critical issues		
Lessons Learned: <ul style="list-style-type: none">Describe in bullet format the lessons learned		
Classification: Actual or potential? <ul style="list-style-type: none">x		

7 HIGHLIGHTING CHANGES

Changes made:

General – Focus on reporting requirements and reference to Management Regulations § 29.

1.1 Purpose – focus on learning and experience transfer from well incidents.

2.1.1 Drilling and completion colour codes – change to definition of Grey incidents.

2.1.2 Well intervention colour codes – Change to definition of Grey incidents.

3. One Page Well Control Incident Presentation – Focus on learning.

4.1.2 Principles for classification of well incidents – Focus on learning and creation of a One Pager for incidents with learning potential.

Appendix A – New Flowchart for process of reporting and experience transfer of well control incidents. No change in details.

Appendix B – Extension of Non-classified Drilling and Completion incidents

Appendix B - Extension of Non-classified Well Intervention incidents

Appendix C – Extension of examples for non-classified incidents