

SINTEF Offshore Blowout Database

Well Control Seminar, Norwegian Ocean Industry Authority (Havtil), 19 February 2025
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About the database

1. Initiated in the early 80-ties, by Sintef (Marintek)
2. Managed by ExproSoft/Peloton since 2001
3. Database and reports updated annually
4. Funded by operators and consultancies through an annual fee
5. Presently 14 sponsors, (7 operators, 6 consultants, and 1 insurance company)



Why an offshore blowout database?

The SINTEF Offshore Blowout Database, and associated reports, forms the basis for well related risk assessments as;

- Blowout Scenario Analysis,
- Total Risk Analysis (QRAs), and
- Risk analysis for drilling rigs
- Environmental Risk Analysis

There is much information about each incident stored in the database, therefore,

- D&W experts are using database for various specific studies.
- The database is also used for educational purposes

Overview of incidents vs. area and time periods

Area	50-ties	60-ties	70-ties	80-ties	90-ties	2000-2009	2010-2019	2020-2024	Total
Norway			3	13	15	6	5		42
UK		3	1	9	22	19	5		59
US GoM OCS	6	29	61	78	52	60	29	9	324
US Other	2	10	17	12	11	21	23	13	109
Europe other		3	1	4	1		3		12
Canada			1	4					5
Caspian Sea			2	5	4	2	3		16
Asia			7	18	16	8	7	2	58
Latin America			9	13	3	7	3		35
Middle East		1	9	11	2	3			26
Oceania		4	1	2	1	2	1		11
Africa		4	6	9	4	4	2	2	31
UNKNOWN	1								1
Total	9	54	118	178	131	132	81	22	729

Phase of operation

Description	Remarks
Completion	Activities associated to well completion activities
Dev.drlg	Development drilling
Expl.drlg	Exploration drilling, includes wildcats and appraisal wells
Production	Production, injection, closed in wells
Wireline	Wireline operations in connection with a production/injection well, not wireline operations carried out as a part of well drilling, well completion or well workover
Workover	Workover activities, not including wireline operations. Snubbing and coiled tubing operations
Abandoned well	Temporary abandoned, permanently abandoned, and long-time closed in/suspended wells are incidents are included.

Category and Sub-category

Main	Category	Subcategory
Blowout and well release	Blowout (surface flow)	Totally uncontrolled flow, from a deep zone
		Totally uncontrolled flow, from a shallow zone
		Shallow gas “controlled” subsea release only
	Blowout (underground flow)	Underground flow only
		Underground flow mainly, limited surface flow
	Well release	Limited surface flow before the secondary barrier was activated
		Tubing blown out of well, then the secondary barrier is activated
	Diverted well release	Shallow gas-controlled flow (diverted)
	Unknown	Unknown

Example database incident



SINTEF *Offshore Blowout Database db-per.azurewebsites.net* [Log out \(Per Holand\)](#)

Filter Overview Exposure data

Edit

Category and location

Blowout ID : 671
Date : 15.10.2016
Category : Well release
Sub category : Limited surface flow before the secondary barrier was activated
Country name : NORWAY

Field : Troll
Water depth : 327 [m]
Operator : Statoil
Installation name : Well 31/2-G-4 BY1H/2H
Installation type : SUBSEA PROD
Remark : 4 slot template G

Well description

Well depth : 1602 [m]
Well status : KILLED
Casing size : 10,75 [inch]
Casing depth : 1602 [m]
Mud weight : 0 [kg/m³]
B.H. Pressure : 0 [bar]
MMSIP : 0 [bar]
MTSIP : 0 [bar]

API grade : 0
Gas volum : 0 [1.000 m³/day]
Oil volum : 0 [m³/day]
Water volum : 0 [m³/day]
Gas/oil ratio : 0 [Sm³/Sm³]
Rock type : UNKNOWN
Formation age : UNKNOWN
Formation name : UNKNOWN

Blowout causes

Loss of barrier 1 : C13.TUBING PLUG FAILURE
Remark : Used FCV (Flow Control Valve) and GLV insted of deepset plug. Cycled open by mistake
N.S standards : Yes

Loss of barrier 2 : B1.FAILED TO CLOSE BOP
Remark : BOP closed after som gas was released
External causes : NO
Human error : Inadequate planning of and compliance with procedures

Present operation

Phase : WORKOVER, P&A
Operation : W1.PULLING WELL EQUIPMENT
Op Remark

Activity : F2.PULL TUBING
Remark

Blowout characteristics

Flowpath : B.THROUGH ANNULUS
Remark
Flow medium : Gas (deep)
Pollution : NO
Lost production
Fatalities : 0
Duration : 0,0007 [days]

Release point : DRILLFLOOR - THROUGH ROTARY
Remark
Flowrate : 0 [m³/day]
Ignition time : 0 [hrs]
Ignition type : NO
Consequence Class : NO
Material loss : 0 [mil US\$]

Other

Control method : BOP

Remark

Revision date : 30.03.2020

Data quality : VERY GOOD

Reference : Statoil Investigation report. PSA Investigation report

Remarks : The Well 31/2-G-4 BY1H/BY2H in the Troll field Plug should be permanently plugged and and Abandon (P&A) and prepare for a new multilateral; CY1H/CY2H/CY3H from well slot G-4. On 15 October 2016, during the P&A operations; when preparing to pull out with the production tubing, there was an influx of gas into the well that lasted about one minute before the annular valve in the BOP was closed. The string, consisting of production tubing down to 1277 m, tubing hanger, a tubing hanger retrieving tool and drillpipe to surface, was lifted up 6 m, pushed by the water column in the riser and the emerging gas. The initial gas leak rate has been calculated to -48 kg/sec (when the riser was still water-filled) and increasing as the riser was gradually emptied for water, to maximum - 71 kg/sec (calculated rate for an empty riser) until the annular closed. The gas leak on surface lasted approximately one minute. There was no personnel injury due to the incident.

According to Statoil, the FCV and GLV have been used as barrier elements in a subsea VXT system once before, but for a limited operation (replacing an Xmas tree with production tubing intact). According to information received, the intention was to reduce operation time by about 12 hours – the time it takes to install the deep-set plug.

Wells are horizontal Well depth 1602 mTVD, 5369 m MD

Total release around 3000 kg gas

Attachment

Attachments

[ID 671 2016_1154_Granskingsrapport Songa Endurance\(!\).pdf](#)
[Presntation Norsk olje & gass](#)
[ID 671 statoil-investigation-report-songa-endurance.pdf](#)

Extension

Size

.pdf 3,14 MB
.pdf 1,71 MB
.pdf 10,18 MB

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Norwegian blowouts/well releases

Category	Deep or shallow	Development drlg	Exploration drlg	Completion	Work-over	Production	Total
Blowout (surface flow)	Deep				2		2
	Shallow	1	11				12
Blowout (underground flow)	Deep		5				5
Diverted well release	Shallow		4				4
Well release	Deep	1	6	1	5	3	16
	Shallow	1	2				3
Total		3	28	1	7	3	42

Two incidents ignited, West Vanguard in 1985 and Deep Sea Saga in 1976

Fatalities, worldwide

Period	Norway	UK	US GoM OCS	Rest of the world	Total
50-ties			8	3	11
60-ties			36	12	48
70-ties			15	34	49
80-ties	1 ¹⁾	1 ²⁾	18 ⁷⁾	335 ⁴⁾	355
90-ties			1	4	5
2000-2009			2	27 ⁵⁾	29
2010-2019			11 ³⁾	35 ⁶⁾	46
2020-2024				3	3
Total	1	1	91	453	546

1) West Vanguard

2) Ocean Odyssey

3) Deepwater Horizon

4) **Nigeria**, 180 civilians was claimed dead due to pollution, **China Bohai** 3 jack-up 70 fatalities, **Saudia Arabia** 19 persons were killed by inhaling the H₂S, **Brazil** 37 persons were killed during evacuation

5) **Mexico** 23 persons were killed during evacuation

6) Azerbaijan 32 person killed in fires from several wells blowing out

7) Five different incidents involved fatalities

Severe pollution events, worldwide all time

Operational phase	No. of events
Completion	3
Exploration drilling	7
Development drilling	5
Production (normal)	7
Production (external cause)*	6
Workover	3
Abandoned well	1
Unknown	2
Total	34

*Military attack, trawl, storm, external object

Year	Country	Field	Installation Type	PhaseType
1969	US/CALIFORNIA OCS	Dos Cuadras (ST BARBARA)	JACKET	DEV.DRLG
1970	US/GOM OCS	MAIN PASS 41	JACKET	PRODUCTION
1971	IRAN	RESALAT (RAKHSH)	DRILLSHIP	COMPLETION
1973	TRINIDAD	EAST SOLDADO FIELD, Gulf of Paria	JACKET	PRODUCTION
1977	NORWAY	EKOFISK	JACKET	WORKOVER
1979	MEXICO	IXTOC I	SEMISUBMERSIBLE	EXPL.DRLG
1980	NIGERIA	FUNIWA 5	SEMISUBMERSIBLE	COMPLETION
1980	SPAIN	MAR CANTABRICO M-1	SEMISUBMERSIBLE	EXPL.DRLG
1980	SAUDI ARABIA	HASBAH 6	JACKUP	EXPL.DRLG
1982	VENEZUELA	LR-178	SATELLITE	PRODUCTION
1983	IRAN	NOWRUZ 3	JACKET	PRODUCTION
1983	IRAN	NOWRUZ	JACKET	PRODUCTION
1983	VENEZUELA	LAKE MARACAIBO	JACKET	WORKOVER
1984	INDONESIA	BEKAPI,BC-7	BARGE	DEV.DRLG
1985	USSR	Tengiz	UNKNOWN	UNKNOWN
1986	VENEZUELA	LAKE MARACAIBO SLB-5-4X	JACKET	EXPL.DRLG
1987	MEXICO	BAHIA DE CAMPECHE YUM-2	JACKUP	EXPL.DRLG
1989	USSR	CASPIAN SEA,28TH APRIL	JACKET	PRODUCTION
1992	US/GOM NOT OCS	TIMBALIER BAY, WELL 250	BARGE	WORKOVER
1994	NIGERIA	UNKNOWN	JACKET	UNKNOWN
1995	US/GOM NOT OCS	Dixon Bay, Well Bay field	SATELLITE	Abandoned well
1998	US/GOM NOT OCS	Lake Grande Ecaille, Cockrell-Moran	BARGE	COMPLETION
2000	US/GOM NOT OCS	Bay de Chene in Barataria Bay	UNKNOWN	PRODUCTION
2004	US/GOM OCS	Mississippi Canyon 20A	JACKET	PRODUCTION
2007	US/GOM NOT OCS	Bayou Perot	SATELLITE	PRODUCTION
2007	MEXICO	Southwestern Marine Region	JACKET	PRODUCTION
2009	AUSTRALIA	Montara Field	JACKUP	DEV.DRLG
2010	US/GOM OCS	Mississippi Canyon Block 252	SEMISUBMERSIBLE	EXPL.DRLG WILDCAT
2011	CHINA	Peng Lai 19-3 (PL19-3) oil field, Bohai Bay	JACKET	DEV.DRLG
2011	BRAZIL	Frade oil field	DRILLSHIP	EXPL.DRLG APPRAISAL
2013	ANGOLA	DIK-106	SUBSEA PROD	PRODUCTION
2016	US/GOM OCS	GC 248	SUBSEA PROD	PRODUCTION
2017	US/GOM OCS	Mississippi Canyon 209	SUBSEA PROD	PRODUCTION
2019	INDONESIA	YYA-1 well, offshore North West Java	JACKUP	DEV.DRLG

Ignited events US GoM OCS, UK, and Norway 1980 – 2022

Main Category	No ignition	Ignited events
Blowout surface flow	129	27
	82,7 %	17,3 %
Blowout (underground flow)	17	
	100 %	
Diverted well release	35	1
	97,2 %	2,8 %
Well release	94	3
	96,9 %	3,1 %
Unknown	1	
	100,0 %	
Total	276	31
	89,9 %	10,1 %

*Incidents caused by external loads (storm, fire etc.) are not included

Annual deliveries

- Updated version of SINTEF Offshore Blowout database (internet access), including reference documents
- Excel version of the database
- Annual report “Blowout and Well Release Characteristics and Frequencies” (prepared by SINTEF)
- Annual report “Blowout and well release frequencies based on SINTEF Offshore Blowout Database” (Prepared by Vysus)

Thank you