



Design

WSOG - History and Future

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WSOG - History & Future

A summary of the development and worldwide use of Well Specific Operating Guidelines

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Sample WSOG

DP REQUIREMENTS FOR DRILLING, TESTING & WELL INTERVENTION

Well Specific Operating Guidelines (WSOG) Category A, B, C, D

Unit/Vessel: Deepwater X Well: **SAMPLE** Operator: **BP GROUP**

Condition		Green	Advisory	Yellow	Red
ANY DP INCIDENT	BLACK-OUT of ALL HV NETWORKS				Immediately
	DRIVE OFF Incident or DRIFT OFF Incident or FORCE OFF Incident Unit offset deviation from start point Waterdepth: 380 metres			6.5 metres OR immediately when recognized by DPO	Immediately when confirmed that situation cannot be controlled or NOT > 11 metres
INTACT DP SYSTEM	DP position footprint	< 5 metres	> 5 metres	10 metres	15 metres
	DP heading footprint	< 2 deg	2-3 deg	If threat to position	If threat to position
Power consumption each network (3-split configuration)		< 50%	Any PMS warnings,	>70% or loss of one power station + Consequence alarm	Situation specific
Thrust consumption each online unit,		< 50%	Thruster & PMS Warnings	Consequence alarm	Situation specific
Position reference available		3 independent	Loss of a system or performance limitation	2 (situation specific)	If threat to position
DP control system (including IAS- DP controllers)		2 + 1 backup	Any failure or loss of performance in any system	1 or loss of failure of backup controller	Loss of all system or unable to maintain position
Wind sensors		3	2	1 or loss of backup wind sensor (atb, aft)	If threat to position
Motion sensors (MRU)		3	2	1 or loss of backup MRU (No. 1)	If threat to position
Heading sensors (Gyro)		3	2	2 or loss of backup gyro (No.1)	If threat to position
DP-UPS		3	2	2 or loss of backup UPS (No.1)	If threat to position
IAS System		No controllers or network alarms	Loss of one network or one of redundant controllers/servers	Loss of 2 of the redundant controllers/ server in any system	If threat to position
Comms systems		3 system	1 system not operating	Situation specific	Situation specific
Riser limitation UFJ		0-1.5 deg	2 deg	Situation specific	Situation specific
Riser limitation LFJ		0-1.5 deg	2 deg	> 2 deg	4 deg
Wind speed (10m/10s)		0-20 m/s	20 m/s	Situation specific	Situation specific
Wind direction		Situation specific	Situation specific	Situation specific	Situation specific
Sign, waveheight		0-4 m	5 m	Situation specific	Situation specific
Riser twist		+/- 17 deg from BOP landout	>17 deg advice BP Group	Situation specific	Situation specific
Slip ring / Slip joint		Fully operable	Any failure or problem		
Action required		Normal status	Advise Master, Driller, Toolpusher, BP Group Rep.	Issue alarm and follow procedures	Issue alarm and follow procedures
Notify OIM immediately (Y/N)			Yes	Yes	Yes
Notify BP Group immediately (Y/N)		Normal condition	Yes	Yes	Yes

Table 13 WSOG Sample



What is WSOG

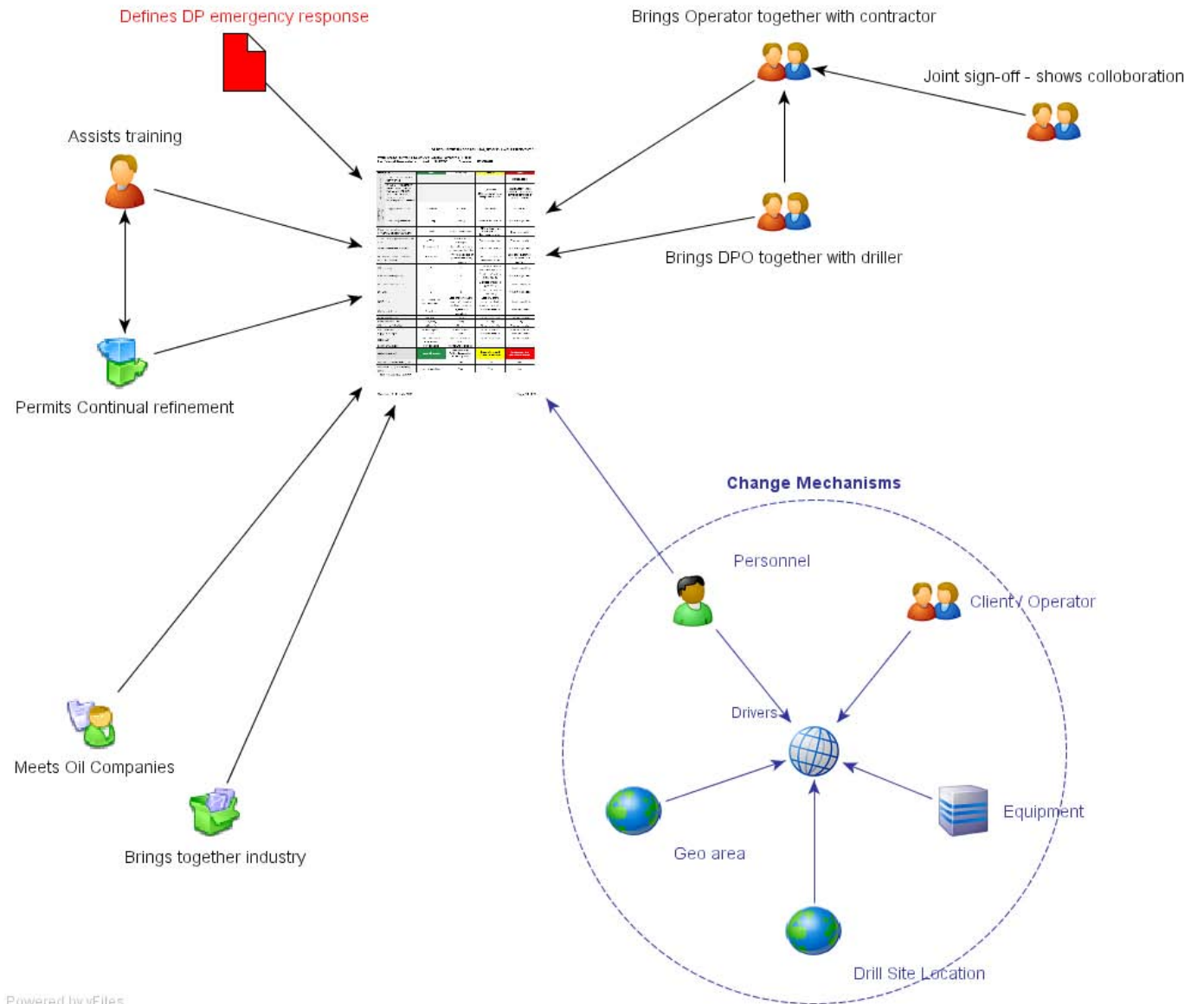
WSOG is effectively a purpose built 'HAZOP' for DP Ops which, because of its design simplicity, has had a great deal of take-up around the world.

As well as being a simple and effective HAZOP tool, it provides the following advantages:-

- DP Emergency response matrix defined
- Assists training of Key (& especially new) personnel
- Brings together driller and DPO (drilling and marine)
- Brings together contractor and client
- Shows that the contractor has a credible system
- Allows for (and is designed for) handling change i.e.
 - New personnel
 - new equipment
 - change of site
 - geographic location
 - client



What does WSOG do



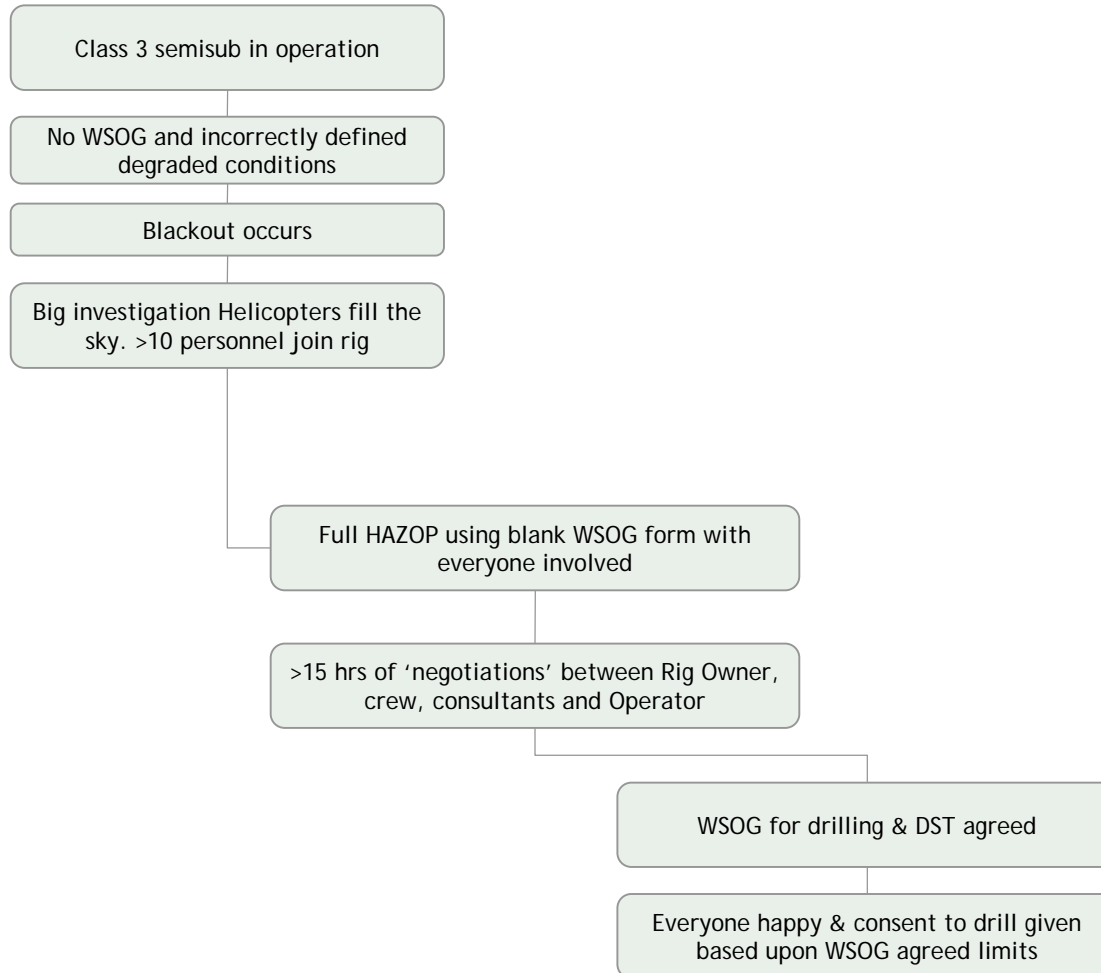


Who uses it

- Mandated in a large number of Corporate DP requirements for a range of activities including drilling, well intervention, floatel operations
 - Statoil (1999 onwards)
 - Norsk Hydro (2000 onwards)
 - BP (Norway from 1999, rest of world from 2004 onwards)
- Others
- A large number of drilling contractors use this 'model' offshore
- MMS study - (DNV) 2004 'Guidance on safety of well testing' makes reference of WSOG with sample
 - Latest BP requirements
 - Joint Statoil / Hydro Technical requirements
 - FOGS - Floatel Operating Guidelines
 - WSOG is now being advanced and developed in Norway for moored unit requirements.

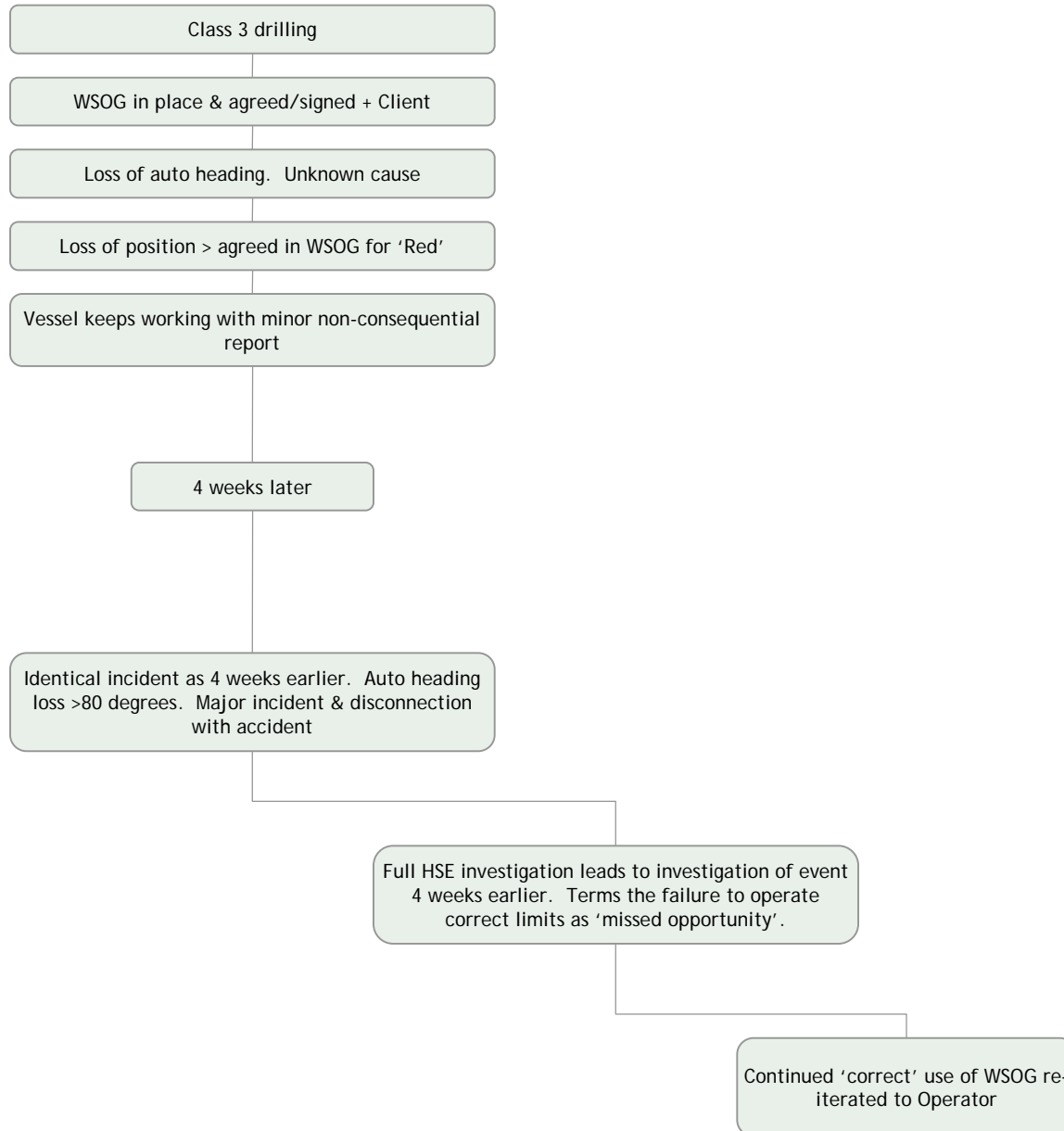


Incident 1





Incident 2



Source UK HSE & AAIB



Conclusions 1

- WSOG represents the most clear & fair method in use today. (up to industry to decide that)
- Having a mature WSOG system will satisfy Oil Operators & regulators during verification processes.
- WSOG eliminates negative reporting if followed correctly. Ref. Incident No. 2
- Limit setting HAZOP should take place prior to each well. (Even if everything is the same)
- There must be consensus following the WSOG limit setting exercise & 'sign-off'.



Conclusions 2

- The limit setting exercise should involve, as far as possible, personnel who have working knowledge of the rigs operating criteria.
- The supply of experienced & competent crew is central here and further re-enforces worries in the industry.
- Effective limits should be agreed between the contractor and operator in order to avoid any confusion offshore.
- Incorrect figures placed in WSOG can make the DP drilling less safe. There have been incidents caused by incorrect figures.
- The concept of lessons learnt and continual improvement is allowed using this procedure which must be continued.
- There has been a large 'take-up' of this simple form since 1999 which must mean that it works. Survey to follow.
- Is ideal tool for HAZOP and has been successfully used in other 'non drilling' DP scenarios
- Norway is advancing the WSOG concept for use in moored operations.



Interactive Survey of attendees

4 x Questions to auditorium

- The authors would like to conclude this presentation with an open questionnaire to all participants in the hall.
- This open questionnaire consists of 4 questions. We would like to get some informed feedback into WSOG as used in today's DP drilling industry.
- Audience is requested to ONLY answer (hand-up) if the questions apply to them.



Interactive Survey of attendees

Questions 1

- How many people (in DW drilling) know about WSOG in limit setting regimes?



Interactive Survey of attendees

Question 2

- How many people use them on their rigs as policy?



Interactive Survey of attendees

Question 3

- How many people present believe that WSOG (in its present form) works well for their operation?



Interactive Survey of attendees

Question 4

- How many people wish to change the present methods of limit settings for something else?

End of presentation. Thank you