Irresponsible of Statoil

Having reviewed all the available information, Bellona feels it is irresponsible of Statoil to resume production at Gullfaks C.

All production from the Gullfaks C platform was shut in on May 19 when the C-06 well lost circulation and took a large kick from the reservoir horizons. A well barrier was lost when the well went on continuous loss.

Allthough a third cement plug is set, the C-06 well still had large anomalous pressures in the C annulus on the 16th of July. The C annulus is the uppermost outer part of the well[1], and a pressure build-up here indicates pressure communication from the reservoir intervals all the way to the pressure valves at the surface.

Leak to the surface

This pressure does not originate from the inner wellbore, nor from the hole in the 13 3/8" casing which was discovered at approximately 1400 m true vertical depth (TVD). If the pressures had originated from the inner annulus similar abnormal pressures would have been observed there. If the pressures had originated from the hole in the 13 3/8" casing the pressures in the C annulus should have bled off when a tieback of the 9 5/8" casing was ran and extended to the surface the 15-16th of July.

The pressure build-up could originate from oil, gas and pressure migration up on the *outside* of the wellbore (see figure 1 – possible pressure and hydrocarbon migration paths are indicated with red arrows) and then *into* the C annulus below the 20" shoe. This could imply pressure build-up and hydrocarbon migration in the subsurface adjacent to the well.

Leaking cement plug

The cement from 1369 to 1643 meter true vertical depth is patchy and of low quality (see figure 1). There might also be an interval of cement lacking below the 20" casing shoe

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[1] The borehole annulus is the space between the drillpipe and the walls of the well.

allowing hydrocarbon flow to enter the outer annulus and all the way up to the surface safety valve. Prior to the tieback ran the 16th of July pressures in the C annulus were 56 bar, at one point rising as high as 65 bar. The valves are predicted to withstand approximately 70 bar. After Statoil resumed production pressure readings in the C annulus were still reported to be around 40-45 bar. Today they are reported to be around 20 bar. .

The well is not safe yet

Anomalous high pressures in the C-annulus of 40-45 bars can indicate a pressure leak on the outside of the well-bore, which again might be enhanced and worsened by an on-set of production and water injection at Gullfaks C. The first kick in the C-06 well was taken the 22th of December 2009. The Norwegian Petroleum Safety Authorities classified this event as red. Statoil's investigation report following this event concluded that the water injection strategy at Gullfaks most likely had caused secondary pressure increases in the Lista and Shetland Formations. Overpressures encountered in these formations are believed to have caused the recurrent problems in the C-06 well. Resuming production at Gullfaks C implies onset of water-injection which might trigger further pressure build-up.

Bellona criticise that the production has been resumed at Gullfaks C when the subsurface adjacent to the wellbore might be vulnerable to induced production pressures changes and there seams to be a unresolved situation with regards to well barriers. What are the consequences if resumed water injection increase pressures and enhance recharge of hydrocarbons to shallower formations?

Bellona would like to know how Statoil explains the pressurized c-annulus and justify resumed production. If it is believed that the c-annulus is pressurized due to a leak from the reservoir, production should not be resumed. If abnormal pressures in the C-annulus is a common phenomenon at Gullfaks, and the risks associated with this is accepted this should be communicated.

Failed water and gas injection strategy

As one of the only, maybe the only operator on the Norwegian shelf, Statoil has premission to inject water in the sealing formation. In addition Statoil has got approval to account for shale as one safety barrier.

The underground leak currently experienced at Gullfaks C shows that these two special permits should be reconsidered.

There has been two previous well kicks and loss of barriers in the C-06 well. In addition, operational problems have occurred during drilling and completion of other wells on both Gullfaks A, B and C. These accidents, their frequency and the general experiences from drilling at Gullfaks confirm that there are pressure conditions which are difficult to control and associated with a great risk. The encountered extreme over- and under-pressures have led geologists and engineers in Statoil, the Norwegian Petroleum Safety Authority and other companies to conclude that the water injection might have induced unexpected and abnormal pressures.

Bellona demands revised drilling program

Bellona stresses the need to revise reservoir models and simulations to identify why and where these pressurized zones develop. This is crucial in order to predict both the extent and development of the dangerous pressure zones and has to be performed prior to any further drilling at Gullfaks.

The drilling of 16 new side-tracks and well-operations and 1 cutting injector must be revised in light of the blow-out at Gullfaks in addition to the failed cutting injection strategy at other fields in the Tampen area.

For the Gullfaks area drilling of 16 new side-tracks and well-operations and one cutting injector (see Figure 2) need to be revised in light of the leak at Gullfaks.

An accident never happens alone?

Troubles are also reported from the Gullfaks A platform, where a casing (unknown interval) is said to be leaking or parted. Bellona has not been able to confirm this report and neither has the Norwegian Petroleum Authority received any reports on this issue.

Subsurface leak

Enormous amounts of drilling mud are lost in the C-06 well. No one knows for sure where the mud goes; it disappears into the side-wall formations in loss zones. The most optimistic predictions are that the mud is captured in shallower sand-layers like the Utsira Formation..

As a third point Bellona request seismic acquisition of data tracking the underground blowout of oil and gas, in addition to the mud-loss in the subsurface to ensure that this will not reach the surface.

Where does the oil and gas go?

In the nearby 34/10-9 well a 1980 well-log interpretation shows that Utsira is not a clean sandstone in this area and therefore might not be able to leak off pressure- and hydrocarbon charges. Injection into the Utsira Formation at one of the Gullfaks satellites Tordis resulted in fracturing and subsequent leakage of hydrocarbons to the ocean due to a tight and clay-rich Utsira Formation in this area[2].

As for the 2/4-14 blowout in the Ekofisk area there might be a subsurface leak at Gullfaks which is not observed at the surface. Shallow seismic shows sand-intervals around the 20" casing which might bleed off a leak. New seismic data is required to document or exclude a subsurface blowout. In addition new shallow seismic can describe the recent development of previous documented shallow gas zones[3].

A possible leakage at Gullfaks C will probably not be observed adjacent to the platform. Statoil uses ROV and sonar in addition to gas level monitoring under the platform to make sure that there is no leakage to sea. But, the C-06 well is a side-tracked horizontal well extending laterally more than 1,5 kilometres away from the platform.

It is not sufficient to watch the sea near the platform, - the leak might as well be more than a kilometre away from the platform.

Bellona requires external investigation

Gullfaks is generally referred to as "The Norwegian Playpen". Gullfaks (with Gullfaks South) is the only 100% Norwegian owned oil field on the Norwegian shelf. Statoil ASA[4] (the state

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[2] A tight and clay-rich rock does not have the properties required to inject large volumes of mass.

[3] http://www.npd.no/engelsk/cwi/pbl/wdss_old/858_01_WDSS_General_Information.pdf

[4] Statoil is ranked as the 26 and 27th largest oil company in the world by PIW (Petroleum Intelligence Weekly) and is said to be the largest offshore oil company in the world.

of Norway is the largest stakeholder with 62.5% of the shares) holds 70% of the shares and Petoro (wholly owned by the state of Norway) 30% of the shares.

Bellona questions the lack of non-Norwegian peers and a broader experience to ensure safe and responsible production at the field.

A non-Norwegian oil company or foreign equivalent authority has to be included in the analysis group investigating this accident.

1.7 billion NOK in delayed earnings

2 months of shot-down production from Gullfaks C implies none or reduced production from the Gimle, Tordis and Gullfaks South fields in addition to Gullfaks C. Assuming production rates as of 2009 (from NPD "Facts" 2010) give 20 000 barrels per day from Tordis, 5 000 barrels per day from the Gimle field and approximately 35 000 barrels per day from the Gullfaks C and Gullfaks Sør fields. That is oil worth of 1.6-1.7 billion NOK in delayed production. In addition comes delayed income due to gas and NGL production and costs of plugging and handling the problematic well.

Bellona questions resumed production

If Statoil claims they can handle processing of oil and gas from the Gullfaks satellites while securing and handling their still unstable C-06 well Bellona has minor objections to this, but to resume production from Gullfaks C itself is un-responsible and believed to be associated with risks that should not be accepted.

How do the new B and C annuluses respond to the current solution with a tieback of the 9" – have they bled of pressures? Was the tie-back successful? What does the temperature-log in the new 9-liner show? Is the drill string still in the wellbore? If it is safe enough to start production the situation should be "normalized" enough to pull out of the hole? Can Statoil show to any wire-line logs, pressure or load tests verifying the integrity of all the cement plugs? These are crucial questions Bellona hopes Statoil has asked and answered before resuming production.

Statoil seams to accept abnormal pressures in the C annulus. If these pressures are recharged by hydrocarbon pressures from down below the 9" (the reservoir) there might be leaks behind casings and along the wellbore. These scenarios cannot be excluded before the pressures in the C-annulus are bled down to zero.

Bellona questions resumed production when there is a unresolved situation with regards to well barriers.

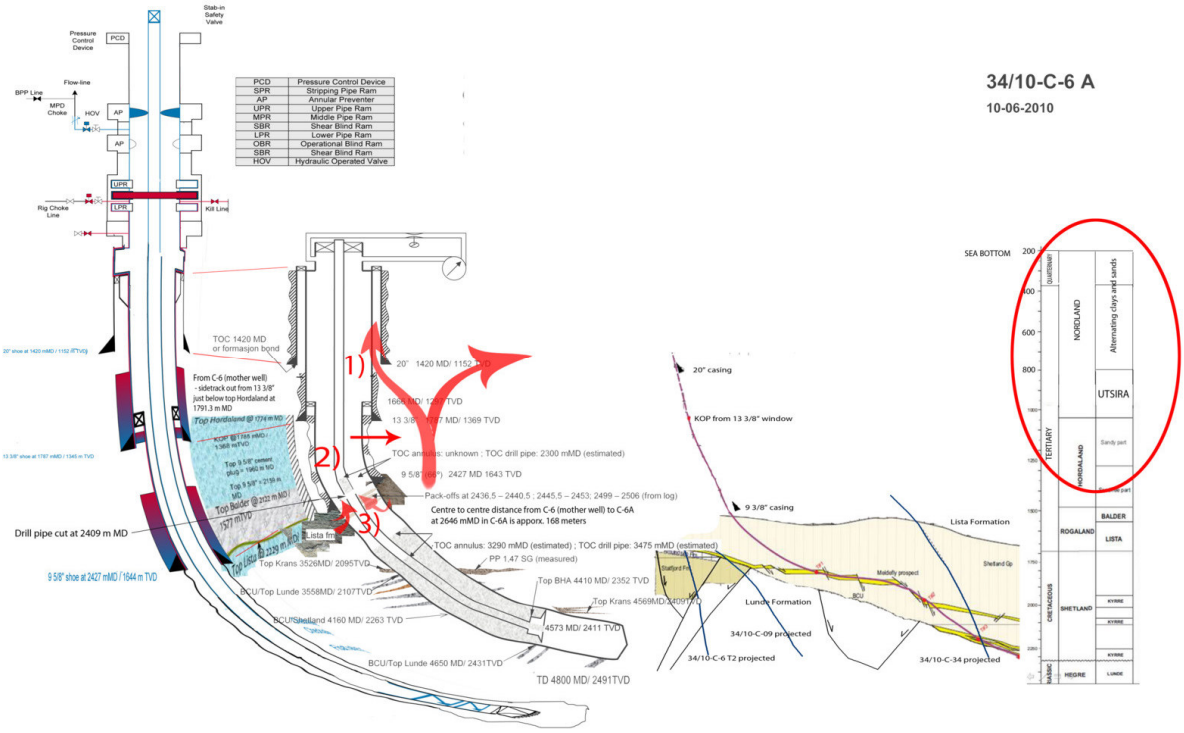

Figure text **Figure 1:**

1) Migration of hydrocarbons in the well and through holes in the 13 3/8” casing 2) Migration of hydrocarbons from the Lista and Shetland Formations through overlying formations. Hydrocarbons in the Lista and Shetland Formations have not previously been reported – these might originate from locale hydrocarbon accumulations at well C-06 or from the water injection itself. 3) Migration of hydrocarbons from the Lista and Shetland Formations along the wellbore or through overlying formations 4) Migration of hydrocarbons from deeper reservoirs (Krans and Lunde) via Lista/Shetland along the wellbore or through overlying formations. Area encircled in red: This is the critical overlying horizons which might or might not bleed of pressure and hydrocarbon leaks.

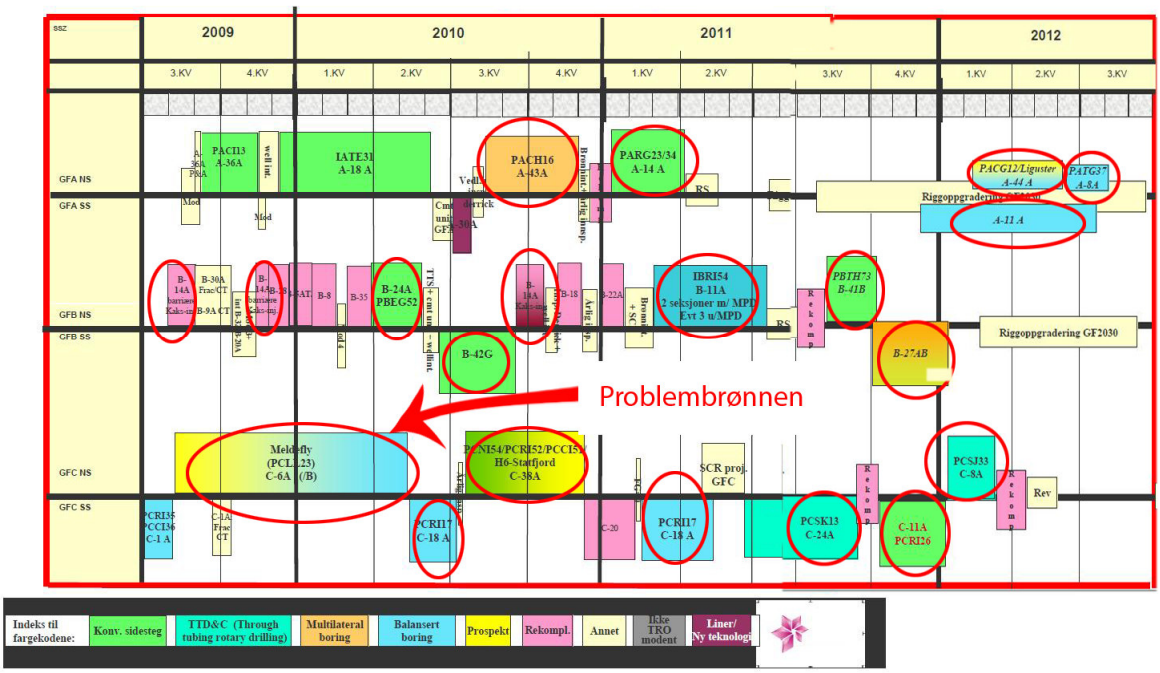

Figure text **Figure 2:**

Statoil`s drilling plan for the Gullfaks area for 2010 and 2011. New wells and side-tracks are en-circled in red.