Offshore Exploration in the Arctic

Alaska's Arctic Ocean is unprepared for a blowout like the Gulf of Mexico BP Deepwater Horizon Exploration Well Incident

The ongoing blowout from the BP Deepwater Horizon exploration well, in the Gulf of Mexico, has the potential to cause environmental catastrophe, despite the fact that it happened in a temperate region with substantial spill response infrastructure nearby. Last fall the Department of Interior approved Shell's plan to drill exploration wells in the Chukchi and Beaufort Seas this summer. In Alaska's Chukchi Sea, there are proposed oil and gas exploration drill sites up to 140 miles offshore which, for much of the year is dominated by moving packs of sea ice, extreme storms, darkness and sub-zero temperatures. The fleeting Arctic summer isn't much kinder with high temperatures in the 40s, gale-force winds, week-long storms, and heavy fog restricting visibility. Oil spill cleanup equipment to respond to a blowout is much further away and docks large enough to manage cleanup vessels are hundreds of miles away.

MMS has approved exploration drilling in the Arctic Ocean without considering the impacts of an accident like the ongoing BP Gulf disaster or the increased difficulty of responding in the Arctic.

- **The risk of a blowout occurring in the Arctic Ocean during exploration has been dismissed**

In its analysis of potential impacts from oil spills during exploration this summer in the Arctic Ocean, Shell states, "a large oil spill, such as a crude oil release from a blowout, is extremely rare and not considered a reasonably foreseeable impact."[1]

Summer ice in the Chukchi Sea. Courtesy of NOAA

MMS's analysis of the impacts of an oil spill during exploration ignores any blowout risk as well, stating "the probability of a large spill occurring during exploration is insignificant and, therefore, this [environmental assessment (EA)] does not analyze the impacts of large spills from exploration operations."[2]

The Gulf of Mexico BP Deepwater Horizon well blowout occurred during exploration when the blowout preventer failed to work.

[1] Shell Chukchi Sea 2010 Exploration Plan (Chukchi EP) at 160.
[2] MMS 2009 Chukchi Environmental Assessment (Chukchi EA) at A.10.

- **The quantity of oil that may spill in the Arctic Ocean has been underestimated**

In its review of the potential environmental effects of Shell's exploration plans, MMS analyzes only the effects from a small diesel fuel spill of 48 barrels (2000 gallons), explaining that this was justified because of the low risk of a larger crude oil spill.[3] In its review of the Chukchi Sea Lease Sale (Sale193), MMS analyzed the effects from a platform spill totaling 1,500 barrels (63,000 gallons) of oil.[4]

By comparison, the National Oceanic and Atmospheric Administration's (NOAA) Office of Response and Restoration estimates that the Gulf of Mexico blowout is spilling 5,000 barrels (210,000 gallons) of oil per day.[5] As of April 27th, Coast Guard officials say the oil spill now covers an area 100 miles by 45 miles at its widest points, and continues to grow.[6]

- **There is no adequate plan for responding to a blowout in the Arctic Ocean**

Shell assumes that if a blowout were to occur, the drill rig would be unharmed and would be able to engage in spill prevention measures and, if necessary, drill a relief well.[7] In both the Timor Sea Montara blowout and the ongoing Gulf of Mexico blowout, the rig was burned and/or sunk. In an eleventh hour addition to its plans, Shell has stated that the Kulluk, currently stationed in the Canadian Beaufort, would be brought to drill a relief well if the original rig is disabled. However, an MMS-funded study raised concerns that a "Kulluk-like" drilling unit would be unsuitable for the extreme wave conditions in the Chukchi Sea.[8] This is an important concern, as it could be difficult to get a new drill rig on location quickly. For example, it took three weeks for the relief well rig to arrive on the scene of the Timor Sea spill off the coast of Australia.[9]

US Coast Guard responding to the Deepwater Horizon drill rig in the Gulf of Mexico. Courtesy of the US Coast Guard.

The reality of drilling in the Arctic means it could be impossible for another rig to arrive and drill a relief well before the freeze-up leaving the spill uncontrolled during the entire winter, unless it plugs itself with sediment. Additionally, oil spill response vessels may not be able to reach the area of the uncontrolled spill until the following summer (i.e. July) when the sea ice breaks up.

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[3] See Chukchi EA at A-10.
[4] MMS 2007 Chukchi Sea Environmental Impact Statement at ES-4.
[5] *See* http://response.restoration.noaa.gov/topic_subtopic_entry
[6] http://www.jointinformation.com/go/doc/2931/532235/
[7] Shell Oil, Chukchi Sea Regional Exploration Oil Discharge Prevention and Contingency Plan (Chukchi Sea C-Plan) pp.1-22 and 1-57; http://www.mms.gov/alaska/ref/ProjectHistory/2009_Chukchi_Shell/2009_0623_Shell_cplan.pdf
[8] Michael J. Paulin, *Arctic Offshore Technology Assessment of Exploration and Production Options for Cold Regions of the US Outer Continental Shelf* (2008) at 240, *available at* http://www.mms.gov/tarprojects/584/FINAL_REPORT.pdf (emphasis added).
[9] http://www.maritimeupdates.com/off-shore-logistics/west-triton-poised-to-plug-montara.html

Relief well planning for the Chukchi Sea is critical because Shell concludes that the more common alternative well control method, "well capping," is not technically feasible for its drillship subsea wellhead configuration, ruling out an important well control alternative.[10] Voluntary ignition, the other option offered for blowout response, creates the very real possibility that the drilling rig will be destroyed and the well will continue to blowout from the seafloor, as is currently occurring in the Gulf of Mexico.

- **There is no proven technology to clean up an oil spill in the Arctic Ocean**

As ice concentrations increase during fall freeze-up, Shell's proposed methods, mechanical response[11] and in-situ burning,[12] are both ineffective. Recent research in oil spill recovery in ice-covered waters has not been tested outside of a very controlled setting and in the wide-ranging conditions that might be present in the U.S. Arctic.[13] The U.S. Coast Guard has acknowledged that they lack adequate response capability to contain and clean up an oil spill in sea ice.[14] A spill occurring at the end of the planned drilling season (October) could not be cleaned up before sea ice made recovery operations completely impossible.

Despite regulatory protections and technological advances, there are times when spills occur and oil spill response technologies are not sufficient to clean up spilled oil. This period of time, which is referred to as a "response gap", exists in nearly all operating environments, but is perhaps most significant in the Arctic, where seasonal and dynamic ice conditions can make it unsafe for spill responders or impractical to attempt to contain or clean up an oil spill.[15] Even in good conditions, spill response vessels may not be able to reach these remote areas in time to prevent impacts to wildlife and ecosystems. As NOAA recently noted, "[r]ecovery rates of spilled oil in optimum situations (calm weather, in a harbor, rapid response) rarely exceed 20 percent, and response to spills in ice in remote areas is substantially more challenging. On-scene response efforts may take days to weeks to implement, and are rarely effective."[16]

The need to improve mechanical recovery capabilities in ice is cited repeatedly in published literature. However, the literature also notes a low confidence in the ability to improve mechanical response in ice, acknowledging that technological "improvements are likely to be incremental, resulting in modest increases in recovery effectiveness."[17]

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[10] Chukchi Sea C-Plan, p. 4-4.

[11] National Research Council (NRC). (2003). Board on Environmental Studies and Toxicology and Polar Research (BESTPR).*Cumulative environmental effects of oil and gas activities on Alaska's North Slope.* The National Academies Press. Washington, DC. at 218 (noting that in the 2000 Beaufort Sea trials in broken ice, ice coverage of over 1% during freeze-up actually jammed up the equipment.)

[12] *"In-situ burning has not been demonstrated in actual field tests to be effective in ice coverage above 30% or below 70%. Above 70% coverage, sea ice may provide natural containment, although the sea ice may transport oil great distances so that it is unavailable for response once spring break up occurs. At higher ice concentrations, significant logistical, technical, and safety challenges remain in tracking, accessing, and igniting the oil slicks and recovering burn residues.* " (DeCola, Robertson, Fletcher, Harvey 2006).

[13] Sorstrom, S.E., P. J. Brandvik, E. Buist, P. Daling, D. Dickins, L-G. Faksness, S. Potter, J.F. Rasmussen, and I. Singsaas. 2010. Joint industry program on oil spill contingency for Arctic and ice-covered waters. Report No. 32. Sintef A14181. ISBN-nr: 978-82-14-04759-2. 40p.

[14] Senate Hearing 111-259, "Strategic Importance of the Arctic in U.S. Policy". U.S. Senate Subcommittee of the Committee on Appropriations. August 20, 2009, Anchorage, AK.

[15] 2009 Arctic Council Offshore Oil and Gas Guidelines: "The Arctic has high sensitivity to oil spill impacts and the least capacity for natural recovery. During much of the year and under many conditions, response capabilities and methods are limited by environmental conditions, lack of resources capable of responding in a timely manner, and limited technologies for responding to oil spills in ice conditions."

[16] NOAA Comments to Draft Proposed Five Year OCS Lands Act Program, 2010-2015 (Sept. 21, 2009) at 6.

[17] Advancing Oil Spill Response in Ice Covered Waters (Dickins 2004) p.11.

- **There are insufficient response assets in the Arctic**

The BP Deepwater Horizon blowout occurred in the Gulf of Mexico, where there is a significant cache of oil spill response resources, vessels, and personnel to support a spill response. There are several major airports nearby and there is significant shoreside infrastructure to support the drilling operations on a day-to-day basis. Facilities are currently supporting about 4000 operating oil rigs and various exploratory activities in the Gulf of Mexico. Unlike the Gulf of Mexico, the Chukchi Sea lease area is in a remote area, more than twice the distance offshore for some drill sites, with almost no infrastructure.

Within a day of the explosion and fire on the Gulf of Mexico rig, BP had mobilized significant resources that would be available on-scene within 24 hours. These included:[18,19]	**By comparison in the Chukchi, Shell's available assets within the first 24 hours would be**[20]**:**
• 32 spill response vessels, most in the 200' class	• 13 total spill response vessels (including 34' workboats, skimming vessels, storage barges, and mini-barges – only eight of these are self-propelled, non-skimming boats)
• Skimming capacity of >171,000 barrels/day	• Skimming capacity of 24,000 barrels/day
• Offshore storage capacity of 122,000 barrels with another 175,000 barrels of storage capacity on standby	• Offshore storage capacity of 28,000 barrels (a 513,000 barrel tanker is located within 240 nautical miles from the drill site and would likely not arrive within 24 hours of the blowout occurring).
• 417,320 feet of oil containment boom available, 265,460 feet has been ordered	• Less than 6,000 feet of ocean containment boom
• At least six firefighting vessels on-scene	• Limited firefighting capabilities on the drillship and accompanying Oil Spill Response Vessel
• Pre-planning (identification of priority sites and staging of equipment) for protection of environmentally sensitive coastal areas	• Environmental Sensitivity Index Maps for Alaska are outdated and lack detailed identification of high priority areas.
• A 48-hour spill trajectory forecast	• Trajectory modeling lacks critical data to produce accurate models for planning and response.

[18] Source: http://www.piersystem.com/go/doc/2931/528479/
[19] http://www.guardian.co.uk/world/2010/apr/23/deepwater-horizon-oil-rig-gulf
[20] Chukchi Sea C-Plan, Major Equipment for Offshore Response During the Drilling Season, Table 1.6-6, p. 1-66.