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MALLIK GAS HYDRATE PRODUCTION RESEARCH PROGRAM

WEEKLY SCIENCE REPORT 5

FEBRUARY 19-25, 2008

AURORA RESEARCH INSTITUTE



PROJECT STAFF ON SITE

INUVIK

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MALLIK SITE 66 hearty souls at weeks end

NRCAN - M. Nixon **JOGMEC** - M. Numasawa

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WEEKLY WEATHER

Weather during the early part of the week was clear, calm, but unseasonably mild with temperatures to -10°C . With mild weather often comes concern that a storm will occur. While driving to the Mallik site on February 20th, Scott, Doug and Kasumi observed a dark sky on the horizon to the north over the Beaufort Sea. In past field seasons, Scott has twice seen a similar sky and each time it was followed within 24 hours by an intense blizzard. Indeed a blizzard warning was issued about the same time by Environment Canada (who some might consider an equally reliable source). As the rig up was underway at the time, great effort was made to put the tents over the mud tanks and install prefabricated weather proofing around the rig before the storm arrived. An inventory was taken of fuel, food and water to ensure that we could continue operating even if road access was disrupted to Inuvik. The blizzard hit at 24:00 hrs on February 22th with snow and winds to 75km/hr. Visibility was reduced to less than 50m around the rig site, and to near 0 on the ice road. The Mallik road was closed to all traffic, as was the MGM road and the Government road to Inuvik. The storm lasted about 36 hours with the roads being re-opened at 8:00 on the 24th. While rig activities were scaled back, we were fortunate that we were still able to move ahead with operations during the storm.

Our weather challenges continued even after the end of the Mallik blizzard as the Dempster Highway was also closed. Tomomoto-san, our JOGMEC operations supervisor, is keeping a close eye on this road link as some critical items needed for testing, including our borehole heater, are currently in transit. Again this week, weather is a critical player in the Mallik game!



Nabors Service rig set up and enclosed just hours before the storm (Scott's black sky is just visible in the lower part of the photo.... honest!)



Nabors Service rig during storm. All personnel moving from camp to rig had to use buddy system. Winds slowed down rig up activities but work still advanced with caution.

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FIELD OPERATIONS

The Nabors service rig was rigged up during the week. This involved placing together the rig components. The derrick was mounted on the carrier unit, and was raised on February 18th. The rig tanks, power systems and boilers for the rig were also prepared for operations and the water injection lines from 2L production well were laid to the 3L water injection well. After everything was positioned all equipment had to be winterized by insulating components (as much as possible) and laying steam lines for heat. The testing equipment was also spotted, as were the trailer units to be used for monitoring equipment and computer systems for the pump, heater and testing equipment. By weeks end 90% of the equipment for well operations, injection, testing and monitoring were in place. The Blow Out Preventor (BOP) was positioned and nipped up on February 25. With the completion of pressure testing in the next 24 hours, well operations will be able to be completed. As the week progressed crews for each of the various tasks were moved to the site. By weeks end there were 10 Nabors drillers, 8 testers, 3 from Artificial lift, 2 monitoring people and about a dozen other specialized personnel on site.

A warning for management.... While field operations have gone very well we did have one minor accident this week. A visiting Nabors rig manager unfortunately decided to throw his weight into a job with his people and somehow caught his fingers in a pulley. While he only suffered a minor injury (broken baby finger) this accident points out how important it is to be ever vigilant. A key consideration for this project is to that ensure managers (IPM, Client and contractors) watch and talk, but do not get involved in operations

R & D ACTIVITIES

The Beautiful SKK DTS and ERA Splice- A key goal of our program this year is of course to monitor the formation response to production testing. We are relying on two sensor technologies installed during the winter of 2007 outside of the production casing. The Distributed Temperature Sensor (DTS) system utilizes a fibre optic sensor which runs from the surface down the full well bore outside of the production casing. An optical pulse is transmitted along the fibre and a small part of the signal is scattered back along the fibre through interactions with the glass. The scattering response can then be used to determine formation temperature vs depth with metre depth resolution. An electrical resistivity array (ERA) consists of devices installed down hole that can transmit a small amount of electrical current and then measure the decay of the signal vs time. This method allows derivation of in situ electrical properties which are sensitive to gas hydrate concentration in the sediments. The DTS and ERA sensors were installed in 2007 but had to be cut off at the surface when Mallik 2L-38 was suspended. A critical operation to enable monitoring this year was to re-connect or

splice the cables at the surface to allow them to be connected to data acquisition systems. On February 21st our hearty Schlumberger and SKK geophysics descended into the cellar (the excavation around the Mallik 2L-38 well head) and within a few hours successfully completed a 'beautiful' splice job.... and much to Tomomoto-san's pleasure they did it without using any rig time! SKK monitoring folks were very happy this week as their splices worked and better still their systems tested out well... Well supervised Fujii-san; well spliced Sakiyama and Paulo-sans! Well system tested Morikami and Suzuki-sans!

Meeting with Testers- Scott, Yamamoto, Fujii, Numasawa and Tomomoto-sans met this week with the production testing group to confirm data acquisition plans and also protocols for sampling of produced water, sediment and gas. Plans were also made to stream data in real time by satellite from the pump and testing sensors to Inuvik where most of the management and R&D team will be located.

Steering Committee Arrives Inuvik- Steering Committee members Colvine, Iritani and Yokio-sans arrived on February 25 to begin the Steering Committee meetings. As discussed last week this meeting will decide the duration of production testing. With support from Yasuda-san and the entire R&D and operations teams we are very much hoping that consensus on a path forward. The good news is that Critical points 1 (completion of camp and ice road) and 2 (completion of 3L injection test) have been completed well ahead of schedule and under budget. We expect to pass critical point 3 in the next days and again we hope to be ahead of schedule and under budget.

MEDIA WATCH

The film crew from History Channel's ice road trucker series completed filming of the rig up of the Nabors rig this week and conducted a number of interviews with operations personnel. Scott and Doug took a CBC news crew to the site also and a short news piece on Mallik is to be aired on CBC North on Feb 26th.



SNAP SHOTS OF THE WEEK AT MALLIK



Derrick being lifted onto carrier unit



Mallik 2L-38 DTS splice in progress



Derrick being raised



Drifted snow on testing equipment February 25th.. some drifts were nearly 1.5m high!



Sakiyama and Matlock-sans hanging out in the 2L-38 cellar



The week at Mallik also included a Mallik entry in the oilman's curling bonspiel!



Well services cementer Dan Johnson delivers key shot at 2:45 am game (don't worry folks no work time was lost with leisure activities... all were completed after a 12 hr work day!)



Mallik steering committee meeting meets in Inuvik... Fred-san's with head cut off, Jerry, Sandy, Doug, Iritani, Yokoi, Yamamoto, Tomomoto-sans... Handsome Yasuda, Andrew, and a glimpse of Al!

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