



## **Metadata Citation Information**

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scientist. It is included here as background program  
documentation only.

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# MALLIK GAS HYDRATE PRODUCTION RESEARCH PROGRAM

## WEEKLY SCIENCE REPORT #6

FEBRUARY 25- MARCH 3, 2008

AURORA RESEARCH INSTITUTE



### PROJECT STAFF ON SITE

#### INUVIK

**NRCAN**- S. Dallimore, F. Wright, S. Colvine

**JOGMEC**-, M. Yasuda, K. Yamamoto, T. Fujii

J. Tomomoto, J. Iritani, K. Yokoi, Tsuge

**AURORA**- A. Applejohn, J. McEachern, A. Jenks

D. Ashford, K. Martin

**SKK**-Y. Morikami, P. Primierio, , N. Sakiyama; **JOE**- M.

Kurihara, K. Funatsu; **Tokyo Gas**- T. Kawasaki

**MALLIK SITE** 67 hearty (and somewhat chubbier souls at weeks end)

**NRCAN** - M. Nixon **JOGMEC** - M. Numasawa, K. Fujii

**AURORA**- L. Johnson, W. VanderBurgh, G. Serrano, J. Kanneiser, L. Bueno

**SKK**- K. Suzuki

### WEEKLY WEATHER

Weather continued unsettled this week with another 24 hr blizzard hitting hard on the morning of February 29<sup>th</sup>. Personnel are now finding ways to work through these storms, but with sustained winds of 40km/hr and gusts to >75km/hr, wind chills at times dropped to an incredible -64°C. Obviously it is very tough going under these circumstances and outdoor operations were curtailed significantly during the height of the storm. As has been the norm during storms, the Dempster Highway was also closed for 36 hrs, trapping our borehole heater on the wrong side of Inuvik. By week's end however all roads are open, all equipment has arrived at site and a high pressure system has moved into the region. Gerardo Serrano, our IPM well engineer who hails from snowy Columbia, received slaps on the back (and honorary Canadian citizenship) when he reported the weather on Sunday as 'good news folks it is a beautiful day out here for a change with a high of -30°C!'

### FIELD OPERATIONS

In five consecutive weeks your trusty scribe has had the pleasure of reporting steady progress at Mallik, in some cases well ahead of schedule. While I may have taken a bit of a light hearted approach at times I am sure most of you realize the planning and the effort that has gone into this accomplishment. Unfortunately week 6 has been a challenging week, one which will require adjustment of our schedule and yes perhaps R&D expectations. Blame it on the weather, blame it on the BOP, blame it on leap year, but

please folks don't blame it on folks putting out effort in the field.

Whoa.. you say, what could happen in a week?.. Well those on this distribution list who don't get the daily completion report can perhaps have a close look at the February 28 and March 2 reports provided here. To help in the interrogation, highlighted in yellow is the type of problem we have encountered. The challenge of weather is evident as is the challenge of keeping equipment running. The missing factor that has bit us in the proverbial rear end this week, is the absence of a bit of luck. Simply put, our Blow Out Preventer (BOP) has been our Achilles heel. This is one piece of oil field equipment that does not have a confusing name like 'dog nut' (by the way we did have trouble with the dog nut too, but this is a longer story), as anyone can imagine the BOP is a piece of equipment that is critical to any completion operation. It is our primary line of security in undertaking well operations. Cleaning up the well, running our completion assembly, testing.. even just abandoning the well cannot proceed without a fully functioning BOP. Unfortunately as detailed in the completion reports the BOP has been causing problems all week. Worse as of 24:00hrs on March 3<sup>rd</sup>, the pipe rams on the BOP are not functioning as we are having problems with our accumulator. While most of our equipment on site has back ups, it is not normal to have two BOPs on a job like ours as they are generally very reliable pieces of equipment. Luck has not been with us and we are now on hold awaiting a fix..



*The Achilles heel of week 6- The BOP components prior to rigging up. The annular on the right and the rams on the left are mounted on the well casing one on top of the other. Both function to provide isolation from the well pressures down hole. Both must function to conduct well operations.*

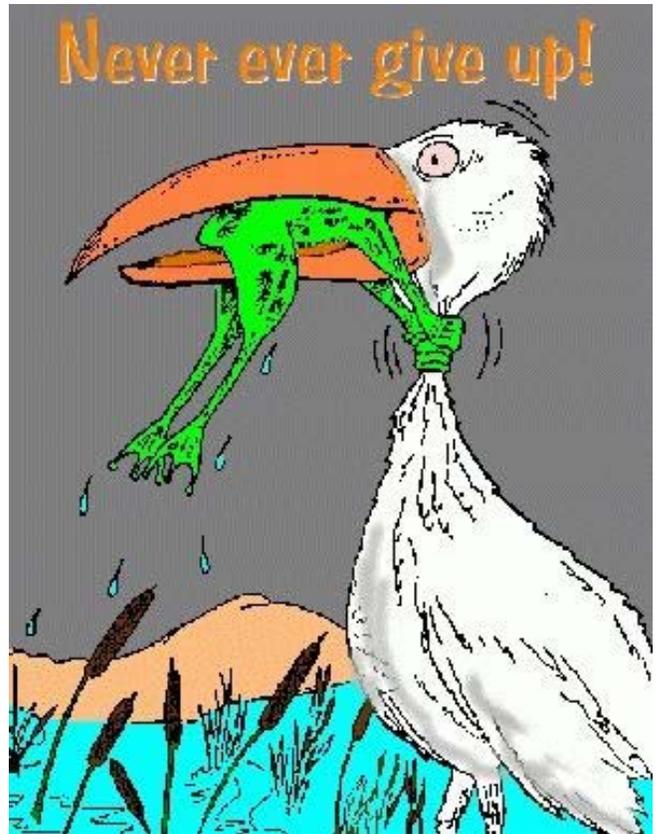
What else?.. Well there is some good news! Work has moved along quite well with preparations for testing. The artificial lift crew has prepared the pump components, control systems and data acquisition systems. The borehole heater has arrived and been spliced to run down the hole with the pump. Testing is set up and ready to roll and the injection lines have been laid and insulated.

And... we have moved through an important operational activity by successfully latching on to our retrievable bridge plug at 1072m. Referred to fondly as the RBP this was the device left inside our Mallik 2L production casing to isolate our perforated testing section at depth from the surface. Of great interest to us both operationally and from an R&D perspective when we unseated the RBP we found our well was alive with 3.5MPa of gas pressure. The chronicle of this event is again best reviewed by taking a close look at the March 2 daily completion report which is attached below.

## R & D ACTIVITIES

**Steering Committee Meeting in Inuvik-** On Feb 25/26, Steering Committee members Colvine, Iritani and Yokio-sans had a very successful meeting with Aurora College, our technical team and finance expert, Tsuge-san. JOGMEC participants also made a site visit on Feb 27<sup>th</sup>. As reported in an addendum to last week's science report (as a simple photo of a flip chart page from the meeting) provisional authority was given for 10 days of production testing. What was not highlighted however, was the positive review by the Steering Committee of the operations and R&D program status. New funds via Aurora Research Institute and the Government of Canada were also accepted as a compliment to the testing program as were efforts by NRCan to reduce operational costs. While we still hope to realize 10 days of testing, provisos were also tabled including; a fixed budget for testing, the target for last day of testing before we move on to well abandonment, and the assignment of contingency \$ and time after testing.

While the Steering Committee, and indeed the R&D team, would like to think there is a straight line to success at Mallik, after the Steering Committee left Inuvik our straight line became impeded with such things as BOP problems, weather and operations. Our hope of course is that the Steering Committee will work with us to straighten our course and ultimately help us succeed with our R&D goals. Adages are often helpful at times like this, . those that quickly come to mind are... 'if it was easy someone would have done it already'; 'failure is not an option', 'stay positive and you will get there eventually'. Cartoons can sometimes help!



*This week our Mallik program (the frog) is dealing with the BOP, weather and little bit of bad luck.. .But if we keep at it we will eventually get there!*

**Our well is alive and kicking** As mentioned in the operations overview, we were very interested to observe the build up of gas pressure under the RBP and indeed returns of gas to the surface during subsequent operations. The cause of the pressure has been the topic of much debate amongst the R&D team. Did we leave formation gas in the lower part of the well bore?, did the gas hydrate dissociation from last year continue after we had set the RBP? Etc.. etc.. Many possibilities were being investigated and for diagnostics we turned to operations for an explanation (IPM, Numazawa and Tomomoto-sans), to our science brain trust (Koji, Fred, Mark Tetsura, Kawasaki-sans), our JOGMEC/SKK monitoring team (Kasumi, Paulo, Morikami, Sakiyama and Suzuki-sans) and our modeling team from JOE (Kurihara and Funatsu-sans). With so many experts I am sure everyone can appreciate that meetings ensued!... Bottom line however.. surely our formation is ready to react and this is a very good thing for our production test.

**NEXT WEEK AT MALLIK**

**WE WILL BE BACK ON TRACK.. BANK ON IT!**

## SKK update by P.Primiero, 29 February 2008

Baseline Temperature measurement for the 2<sup>nd</sup> Winter R&D Program

Monitoring milestones:

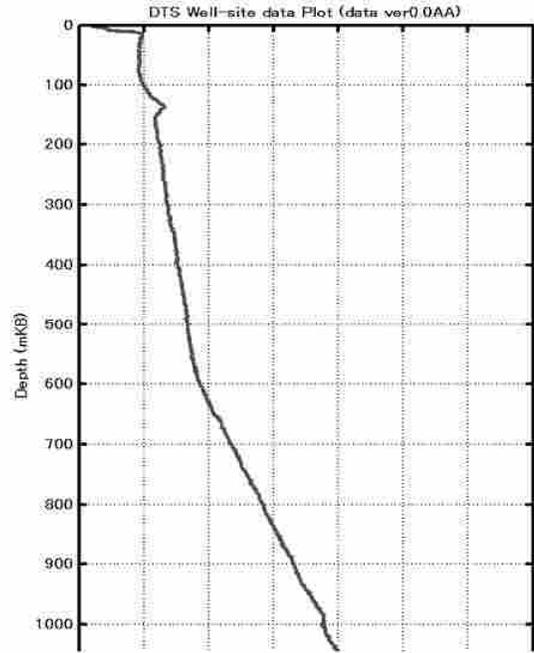
- DTS cable splice - 20 February,
- Monitoring system setup - 21 February
- Continuous DTS measurement in undisturbed conditions – from 21 to 26 February.

Thanks to IPM support, an early start of the DTS measurement allowed the SKK monitoring team to acquire with sufficient accuracy the temperature profile of the formation along 2L-38 Well casing from surface. The profile was acquired before the 2L-38 well was touched by operations, to reveal the downhole temperature after a year from last winter re-entry has past. Several calibration points were set to improve the accuracy of the measurement. At the surface, temperature readings from the optical sensing fiber were compared to calibrated resistance temperature sensors. Daily fluctuations in the surface temperature caused by the strong wind were observed in the initial data. Modeling carried out by the temperature physicist Naoki Sakiyama revealed that such effect could be reduced by covering the surface cables with a meter of packed snow. The whole SKK team participated in the task by shoveling and packing hard snow for a few hours.

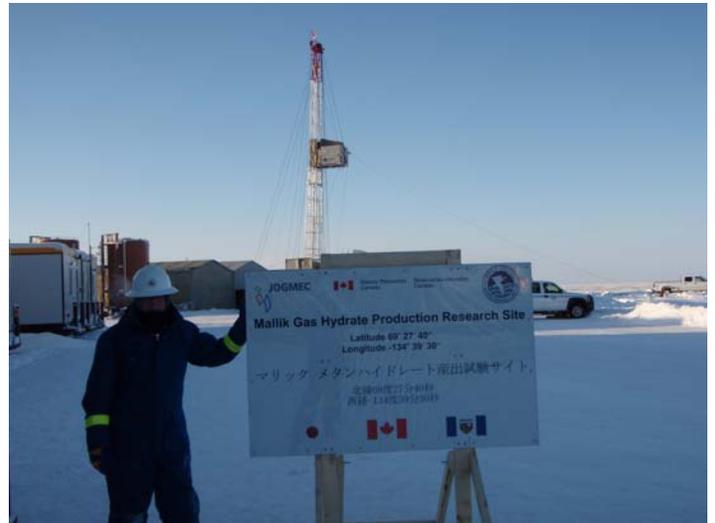


Monitoring team at work with snow shovels (top); waiting for the theory and practice to match (bottom).

The baseline temperature profile reveals the typical temperature curve in the Mackenzie delta: the temperature curve increases to 0 degC in the thick permafrost layer and just below 600m depth the curve kicks off according to the regional geothermal gradient.



## SNAP SHOTS OF THE WEEK AT MALLIK



*Fred-san stands by new signage at Mallik*



Andrew Applejohn presents Yokoi-san with gift from Aurora College to JOGMEC at Inuvik Steering Committee meeting.



Meetings at rig to plan testing



Mallik chef Eileen Gruben on left with her family team nephew 2<sup>nd</sup> Cook John Lennie, sister Darlene Gruben and son Carl Gruben



Dalli-moto-san (Scott and Koji) face off at spaghetti dinner with R&D team for support

## Inuvik Contact Info

### Land lines

ARI Mallik Operations 867-777-3298 Ext 27 and 29

IPM Mallik Operations 867-777-3298 Ext 33

Fax 867- 777-5328

### Cellular phones

Al 867-678-0854; Doug 867-678-5341;

Scott 867-678-5346; Fred 867-678-5344



# DAILY COMPLETION REPORT

DAYS FROM START

35

DATE: 2/28/2008

REPORT FOR: A. Applejohn

WELL NAME		Mallik Gas Hydrate	LOCATION		Mallik 2L-38
CONTRACTOR		Nabors, EGT	SUPERVISORS		Luis G Hernandez, Jay Kanngiesser
Wellsite#		713-948-3950	Cellular #		713-948-3951
PLAN FOR UPCOMING DAY			LAST SAFETY MEETING TIME, LOCATION, TOPIC		
General safety and procedure meeting with all personnel			6:30 Safety Meeting		
Held prior to every shift change, 6:30 and 18:30			PPE, Slippery conditions watch footing, Cold weather so dress		
Road Maintenance - Continue with road maintenance, widening, and repairs.			warm and warm up regularly, make sure machines are warmed up, Wildlife awareness, environmental awareness. Multiple activities and equip		
Rig Ops: Circulate diesel out, warm up wellbore			working on lease requires special awareness.		
RIH to 1072m, circulate well, pressure test annular			Special focus on Industrial incident, finger and hands operations		
REMARKS		OPERATIONAL REMARKS (00:00 - 24:00)		EQUIPMENT ON PROJECT	
FROM	TO	DATE	2/27/2008		
0:00		Repaired Power Plus generator louvers to get building temp to normal (was -30 inside).		Super w/pickup	1 Road
		Thawed frozen pump lines, stabbing valve, and return lines to 63 m3 tank a number		Water Truck	1 Road
	3:00	of times prior to attempting to circulate, pressured up each time.		Plow Truck	1 Road
	3:00	Thawed tubing to depth of 7 m (length of hose) and found several ice plugs.		Grader	1 Road
		Cleared space on tubing, mixed 20 l cesium formate and methanol and put into tubing.		Cat	1 Road
	4:00	Let cesium formate/methanol mix sit for 1 hour to fall to plug and work.		Super w/pickup	1 Lease
	4:00	Attempted to circulate, pressured to 20 mPa. Pressure slowly dropping slowly.		Water Truck's	1 Lease
		Fluid could be heard entering tank. Pumped for 1 hour, depressuring rate increasing.		Terra Gator's	1 Lease
		Line to 63 m3 tank becoming warm sooner than expected, checked lines to and from		30 tonne Picker	1 Lease
	5:30	wellhead, cold. Pump manifold bypass valve leaking.		Loader	1 Lease
	5:30	Pulled 2 joints tubing wet with mudcan, tubing plugged.		Mechanic PU Truck	1 Lease
	7:00	Safety meeting		Mechanic Shop	1 Lease
	7:30	RU lubricator and sinker bar, RIH with sinker bar to 90m, detect plug, try several		Pick-up Trucks	1 Lease
	11:30	times without success. POOH sinker bars.		Cat	1 Lease
	11:30	R/U swab equipment, align returns to diesel tank, swab down to 80m		Light Towers	8 Lease
	14:00	RD swabbing equipment and RU tongs on rig floor		Fuel Sloop	1 Lease
	14:00	POOH dry 73mm EUE tbg down to 80m, cont. to POOH 73mm EUE w/ slushy ice in it		Pump house	2 Lease
	17:00	for 4 joints, solid ice the next 15 joints, dry pipe to the last. Total joints 69 POOH.		Fuel Truck	1 Lease
	17:00	RD mud can and lines, clear cellar.		Tandem vac truck	1
	17:30	RD landing joint from tubing hanger, retrieve BPV, RU pup joint below tbg hanger with		Ski-doo's	2
	19:00	plug, land tubing hanger on casing spool, retrieve landing joint.		10 man sleeper	1 Lease
	19:00	Safety meeting, new crew due to shift change.		Ambulance	1 Lease
	19:30	Reposition pump and return lines to 2L wellhead, changed steam tracing lines			
	21:30	and insulated to eliminate freezing issues.			
	21:30	Re-insulated pump lines from pump barn to doghouse and installed line covers to 3L.			
	22:30	Light snow, wind 20 kph, windchill - 38 C.			
	22:30	Installed SLB pressure transmitter in pump line at wellhead.			
		Attempted blind rams pressure test, SLB transmitter froze off, heated with steam			
		and transmitter back on line, difficulty keeping transmitter pressure and pump pressure			
	0:00	equal due to heat cycles on transmitter and sensing line.			
	0:00	Rigged out pump lines and cleared with steam for shift change.			
	0:00	2-28-08 Crew change, conducted safety and operations meeting.			
	1:00	Pressure tested blind rams to 2.0 and 20.6 mPa each, OK.			
	1:30	Blew pump lines out while rigging in for pipe ram pressure test.			
	2:00	Pressure tested pipe rams to 2 and 20.6 mPa for 10 minutes each, OK.			
	2:30	Attempted to close annular, bag would not close, too cold.			
		Will add heat and make functional prior to need.			
	2:45	Tallied, drifted and ran in hole SLB WR retrieving tool assembly, 70 jts 73.0 mm, L-80			
				Temperature on site -20C	
				Wind NW @ 15km/h: Wind chill: -37C	
				Weather data 6 am, Mallik Weather stat	
		65 people in camp		2-25-08 Weather cloudy w/ light snow	
		Doug Ashford cell 867-678-5341 Mallik site: (713) 948 3951			
		IPM Office at ARI 867-777-3298 x33, Sat phone in Truck 8816-314-66234			
				DAILY COST:	\$233,490
				CUMULATIVE COST:	\$8,600,249

