BANDAR PANJI-1 WELL CONTROL INCIDENT REPORT

EXECUTIVE SUMMARY

I was requested by management to review the Banjar Panji-1 drilling operations from the conception of the Integrated Drilling Management approach until the well broached to surface after taking a kick while pulling out of the hole. The report is based on the daily drilling reports and the mud log for the drilling of the well down to 9297 feet. The report from the occurrence of lost circulation until the well kicked is based on the data from the mud logging unit data recorders, which includes the time, pump pressure, pump stokes, PVT and Flow Show.

The conclusions are as follows:

The Drilling Program and the Well Design were more than adequate to drill the well both from an operational and drilling engineering concept;

The elimination of the 11 ¾" liner based on the 16.4 ppg LOT on the 13 3/8" shoe was a valid decision both from a well design concept and from an operations perspective with an assumed casing seat of 8500 feet. The decision to drill to a maximum depth of 9400 feet at 8739 ft based on the assumption there would be no increase in 14.7 ppg mud weight was valid as the Kick Tolerance at 9293 feet was acceptable.

A minimum influx of 57 bbls of formation fluid, water and gas, occurred during the 27 minutes from the loss of circulation until the well started to circulate. The amount of influx was due to the fact the well was filled up by pumping mud down the drill pipe and no effort was made to fill the annulus as soon as losses were encountered.

After spotting the LCM pill on bottom the well was not circulated during the 7 to 9 hours that took place prior to commencing full tripping operations. This allowed the influx to remain in the wellbore above the bit.

The trip was not conducted as per standard operational procedures because they could not pump out of the hole. The amount of mud pumped was excessive because they could not run the pumps slow enough. They pulled a few stands with the well swabbing and then shut down and pumped an excessive amount of mud, over 3 times as much;

The excessive pumping resulted in a loss in the active mud system which masked the potential of the Kick:

The initial flow was the result of the expansion of gas from the influx that went into solution in the oil based mud. When the hydrostatic pressure got below the bubble point the gas breaks out rapidly;

The well was not shut in during the initial flow and it was allowed to flow for 90 minutes with a pit gain of a minimum of 733bbls prior to shutting the well in. This is equivalent to at least a 5000 ft column of formation fluid in the 12 ¼" hole which means all the formation from 6700 feet until the shoe was exposed to a pressure in excess to the 16.4 ppg fracture gradient;

13 3/8" casing shoe was competent up to a gain of at least 290 bbls so if the well had been shut in when it first started to flow well the shoe would not broken down;

The 13 3/8" casing shoe was exposed to the largest pressure in excess to the fracture gradient but the short period of time between shutting the well in and the fluid broaching to surface in a strait line supports the possibility of a fracture;

The condition of the 13 3/8" shoe will be verified by the drilling of the first relief well as the well is designed to drill in the close proximity of the 132 3/8" casing seat;

1 DRILLING OPERATIONS SUMMARY

Lapindo Brantas Incorporated ***"LBI"*** is the operator of the PSC with a 50% interest in the PSC. The joint venture partners are Medco Energy (32%) and Santos (Asia) Ltd (18%). LBI management decided to utilize an Integrated Drilling Program Management Contract for the drilling of Banjar Panji-1 to simplify the tendering procedure and to minimize the employment of additional personnel. LBI invited all prospective bidders to a pre-bid meeting where the information from the offset well and a prognosis for the drilling of Banjar Panji-1.

PT Medici Citra Nusa "***MCN***" turned in the low bid but prior to the award of the contract the following actions were specified by LBI:

- All Drilling Rig personnel would have a valid Migas certification;
- LBI registered all the MCN Rig Supervisory Personnel, Drillers to Rig Supervisors in a Well Control refresher course in Cepu at LBI expense;
- Drilling Program had to address all the issues discussed in the Pre-Bid meeting.
- LBI contracted Modu-Spec to inspect the proposed rig, TMMJ-04,

The drilling program, prepared by Slamet Rivanto Projects Manager of MCN, was reviewed and approved by Muhamad Taufik and Bambang Heru Yuwono of LBI on February 15th 2006. This program was presented to the partners and discussed at a Haz-Op Meeting, held at the Grand Mulia Hotel, with MCN, Third Party Service Company, LBI Drilling Department and Medco Energy Drilling Department personnel in attendance.

1.1 26" Hole Section

The Migas Safety inspection was performed prior to the commencement of drilling operations at 13:30 hours on March 8th, 2006. The 8 ½" pilot hole was drilled to a depth of 1195 ft, 42 ft higher than proposed, because the ROP and samples indicated the shale was a competent casing seat for the 20" casing. The hole was opened to 26" with a maximum mud weight of 9.0 ppg. The hole was displaced with 10.0 ppg mud prior to running and cementing the 20" casing. The casing was drilled out with a 17 ½" bit and a 13.0 ppg LOT (.2 ppg more than estimated) was attained which verified the 20" shoe competent. The total time of 9.94 days for the 26" hole section included 2.48 days (27.7%) of non productive time.

1.2 20" Hole Section

A 17 ½" x 20" bi-centered bit was used to drill the 20" hole section. The 10.0 ppg KCL/PHPA mud used to drill out had to be increased to 10.8 ppg by 1511 ft; and to 11.8ppg by 2000 ft. due to gas peaks of 600 and 650 units and an

indication the pore pressure was increasing. At 2304 ft the mud weight was increased to 12.4 ppg to stabilize the hole after the hole packed off while circulating prior to making a connection. The increased mud weight left insufficient Kick Tolerance to drill deeper which required the running of the 16" liner. The trip out to log and the logs were run without any problems. The mud weight was raised to 12.6 ppg while reaming the under gage hole which was determined by the caliper log. The 16" liner held up at 1545 ft and was washed to 2144ft without any significant problems. The progress decreased gradually to 20 to 30 min per foot by 2182 ft so the 16" liner was cemented 1055 ft high to the proposed depth in the drilling program. The 16" liner lap was squeezed and pressure tested to 500 psi. The KCL/PHPA mud system was replaced with a 12.3 ppg SOBM system while drilling out the liner with a 14 ½" bit. There were problems with the hole packing off cleaning out the rat hole prior to the LOT. The initial LOT of 14.2 ppg was 0.6 ppg less than calculated from the fracture gradient curve so the shoe was squeezed. The mud weight was increased to 12.6 ppg while drilling out without any hole problems. The 14.5 ppg LOT attained was about 0.3 ppg less than extrapolated from the fracture gradient curve but it was accepted. The total time of 13.7 days for the 20" hole section included 3.1 days (22.6%) of non productive time.

1.3 17 1/2" Hole Section

A 14 ½" x 17 ½" bi-centered bit was used to drill the 17 ½" hole. The mud weight was increased to 13.0 because there were large pieces of shale coming over the shakers while reaming out the 122 foot rat hole. A total of 7 1/2days were required to repair the mud pumps and the circulating system. The mud weight was increased to 13.3 ppg while drilling to 2578 ft with continued problems with the mud pumps. The operations were suspended on April 8th at 16:00 hours due to the continued rig repair problems. The drilling operations commenced on April 26th at 04:30 hours after completing the rig repairs.

A total of 24.6 days (81.9 %) was spent on rig repair during the month of April. The total non productive time of 30.1 days to the end of April represents 56.3% of the 53.6 days spent until then. LBI management, in an effort to improve the drilling rig performance, assigned Willem Hunila to the rig to assist the MCN Rig Supervisory personnel, Edi Sutriono as Drilling Manager to liaise with the Project Manger Slamat Rivano on drilling operations decisions and Nurromat Sawolo as the overall Project Coordinator to review the proposed changes from the Drilling program.

The drilling continued to 3200 ft where the well was flow tested prior to a wiper trip. There were no significant trip gas or hole problems from the wiper trip but the Kick Tolerance was marginal. While drilling below 3200 ft the well was flow tested to determine if there was any increase in pore pressure. The results of flow tests were as follows:

No	Depth	Results	Action
1	3275	Negative	None
2	3500	Positive	Increase mud weight to 13.5 ppg
3	3595	1.5 bbl gain in 15 min	Circulate Bottoms up
4	3595	1 bbl gain in 15 min	Increase mud weight to 13.8 ppg
5	3595	Negative	Increase mud weight to 14.0 to POH for logging

The lack of Kick Tolerance, after the mud weight was raised to 13.8 ppg, was the determining factor in the decision to set the 13 3/8" casing at this depth. The mud weight was increased to 14.0 ppg as a safety margin for the trip out of the hole and the logging job. The mud weight was increased to 14.2 ppg while reaming under gage hole with a 16 ¾" NBR during the wiper trip.

Partial mud loses commenced while running the 13 3/8" casing due to the .3 ppg difference between the mud weight and the LOT and the surge pressures due to the small annular clearance between the 16" liner and the 13 3/8" casing. A total of 756 bbls of mud was lost to the hole while running and cementing the casing. There were no returns for the last 267 bbls of the displacement so most of the 290 bbls of cement slurry was displaced below casing shoe under pressure. The 13 5/8" BOP was installed and pressure tested. The 13 3/8" casing was drilled out and a 16.4 ppg LOT was attained on the 13 3/8" shoe. The total time of 35.4 days for the 17 1/2" hole interval included 25.9 days (73.2%) of non productive time.

1.4 12 1/4" Hole Section

The drilling of the 12 ¼" hole section commenced with 14.2 ppg mud weight but it had to be increased to 14.4 ppg by 3740 ft and to 14.6 ppg by 4020 ft due to an increase in gas units. The mud weight was increased to 14.7 ppg at 4290 ft due to 760 units of trip gas after pulling to the shoe for rig repair. The mud weight remained at 14.7 ppg to 8750 ft (213ft below proposed casing setting depth). This mud weight was adequate as there were 4 wiper trips to the shoe for rig repair and three bit trips without any hole problems. The well was logged and a VSP check shot survey was run to determine the distance to the top of the Kujung. The VSP results were inconclusive as the projective formation top was anywhere from 8800 to 9600 ft.

An OCM meeting was held with all partners and the decision was to drill ahead based on available Kick Tolerance. The maximum depth with 14.7 ppg mud was calculated to be 9400 ft. The drilling continued to 9010 ft where a flow check was negative. At 9225 ft the H_2S sensor at the shale shakers recorded 25ppm. The well was circulated without recording any additional H_2S. The well was circulated for samples at a depth of 9283 ft, while picking up additional drill pipe, but there was no Kujung limestone in the samples. Total lost circulation occurred on May 27th at 12:48 hrs at a depth of 9297 ft. The total time of 23.96 days for the

12 1/4" hole section to 9297 ft included 2.46 days (10.3%) of non productive time.

1.5 Lost Circulation Operations Summary

The pumps were shut off at 12:57 hours. After 5 min the 14.7 ppg mud was pumped in the drill string. It took 105 stokes (9.5 bbls) to fill the drill pipe and reach a pressure of 1143 psi. After the pump rate stabilized at 90 SPM the pump pressure declined each minute until a total of 91 bbls was pumped. The pump rate was increased to 120 and 175 SPM for the last 120 bbls and the pump pressure increased every minute, even though the pumps were slowed down towards the end. The well started to circulate with partial returns after pumping a total of 210 bbls. The pumps were shut off after pumping a total of 221 bbls. The pumping of a 75 bbl LCM pill commenced at 13:59 pm, 35 min after the pumping stopped. It took approximately 90 stokes to fill the drill string (8 bbls) indicating a fluid level of 456 ft in the drill string. The LCM pill was pumped from the slug pit at 86 spm with intermittent returns. The LCM pill was displaced with an additional 146.4 bbls mud at 100 to 110 spm without returns. The pump was shut in at 14:26 hours. Four stands were pulled out of the hole to 8917 ft with a 4 bbl gain. The well was circulated on the trip tank while building 400 bbls OBM volume from 14:50 until 21:50 hours with no losses or gain. There was a total of 477bbls of OBM lost to the hole.

1.6 Trip Summary

Since the hole remained static for over 7 hours while circulating the hole on the trip tank while mixing mud the decision was made to POH, run in with open ended drill pipe, lay a cement plug in preparation to run the 9 5/8" casing. The first two stands were pulled to 8723 ft with the well on the trip tank. There is no record if the hole took the correct displacement. An additional 134 bbls of mud was added to the active system while pulling 1 stand to 8630 ft. The active system volume of 551 bbls was recorded on the mud loggers PVT. There was a gain of 5 bbls instead of loss of 2.8 bbls for pipe displacement while POH to 8254 ft. The next fours stands were pumped out. A total of 107.2 bbls of mud was pumped, based on the pump strokes, but the pit volume only decreased by 73 bbls. (The flow show recorded return flow to the pits for 3 to 4 minutes which could of been the pumping out of the trip tank which could account for the 34 bbls discrepancy).

The rest of the trip was conducted by pulling 2 to 7 stands and gaining 4.4 to 10.9 bbls of mud and then pumping an excess amount of mud 15 to 34 bbls. This continued to 06:17 hours at a depth of 4623 ft. At this depth the cumulative gain while pulling pipe of 64.3 bbls was offset by the pumping of 282.3 bbls of mud. The active system showed a loss of 229.5 bbls. The well started to flow at 06:22 hours as PVT recorded a 34 bbl gain while pulling 2 stands. The next stand was pumped out to 4338 ft, pumped 42 bbls of mud was but the active system gained an additional 92 bbls. The next stand was pumped out to 4246 ft, pumped 25 bbls

of mud and the active system showed a loss of 19 bbls as the gas started breaking out at surface. The trip out was terminated as they pumped 14.7 ppg mud down the drill string at 40 to 45 spm with the well flowing. The Company man was notified at 07:19 and the well was shut in at 7:53 hours. When the well was shut in the active system mud volume was 819 bbls but it increased to 1074 bbls seventeen minutes after the well was shut in. This represents an increase of 255 bbls after the well was shut in. The measurable gain in the active system after the well started to flow was 834 bbls and this does not take into account the mud losses due to gas to surface. The recorded shut in pressures were 350 psi on the drill pipe and 450 psi on the casing.

1.7 Well Killing Operation

The well was killed by bleeding dry gas and mud from the annulus, minimum mud weight out 8.6 ppg, and pumping 14.7 ppg mud in the annulus. After two cycles the well was dead but the drill string was stuck. Worked pipe, maximum pull 400,000 lbs, jars not working. Spotted 50 bbld hi-vis pill. Gas broke out at surface while rigging up Baker Atlas to free point the drill string at approximately 03:30 hours with a maximum H2S reading of 35 ppm. This was less than 20 hours after the well was shut in. Gas and water bubbles blew intermittently for 9 hours with a maximum height of 25 feet with 5 minutes between bubbles. The bubbles decreased in intensity and the time between bubbles increased to 30 minutes after pumping 230 bbls of 14.7 ppg mud. The bubbles decreased in size and intensity after pumping 200 bbls of 16.0 ppg LCM mud but the water continued to flow. A 50 bbls of 15.8 ppg cement slurry was pumped and over displaced with 110 bbls mud. Then 100 bbls of 15.8 ppg cement slurry was pumped and over displaced with 110 bbls mud. The initial injection rate of 2.5 bpm at 370 psi decreased to 1 bpm at 1000 psi after two cement jobs. In addition the bubble activity was minimal. The crater was surrounded with sand bags and the water was hauled away with a vacuum truck. Baker ran a free point indicator and the pipe was backed off at 2980 ft, after an unsuccessful attempt at 3165 ft. While circulating after the back off the crack became bigger so the well was abandoned with two cement plugs and the rig was moved off the location.

1.8 Well Comparison

The following is a comparison of the proposed well design based on the anticipated mud weights and leak off tests, “LOT” and the actual casing setting depths which were dictated by the LOT for the previous casing string and the required mud weight.

Casing Size	Drilling Program	Actual	Remarks
30” Riser	Driven to 187 ft	Driven to 150 ft	NR
20” Csg	Set at 1237ft in 9.3	Set at 1192 ft in 9.0 ppg mud	NR

	ppg mud with a LOT of 12.8 ppg	and recorded a LOT of 13.0 ppg	
16" Liner	Set at 3237ft in 12.3 ppg mud with a LOT of 15.8 ppg	Drilled to 2304 ft with 12.4 ppg mud, Set the casing at 2182ft and recorded a LOT of 14.5 ppg	The calculated LOT at 2182ft was 14.9 ppg
13 3/8" Csg	Set at 4537ft in 14.5 ppg mud with a LOT of 16.1 ppg	Drilled to 3595 with 13.5 ppg mud, inc mud weight to 14.2 ppg. Set casing at 3580ft and recorded a LOT of 16.4 ppg	
11 ¾" Liner	Set at 6537ft in 15.4 ppg mud with a LOT of 16.4 ppg	Not required as the measured LOT at the 13 3/8" shoe was equal to LOT for the 11 ¾" shoe	Contingency
9" Casing	Designed to be set 20ft into the top of Kujung Carbonate at an estimated depth of 8537 ft	Lost circulation at a depth of 9297 ft trying to determine the top of the Kujung formation .	Calculated Kick Tolerance was a 8 bbl gain with a 0.5 ppg Safety Factor at 9297 ft

2 DISCUSSION

2.1 Drilling Operations

The drilling program is very detailed and includes a table of the anticipated problems and the resulting mitigation plan for each hole section.

The casing setting depth for each hole section was determined by the mud weight, LOT and Kick Tolerance. The increase in mud weight were dictated by hole conditions and all the casing setting depths were within acceptable Kick Tolerance limits.

The plot of LOT on the 13 3/8" shoe is included in the Attachments. The 16.4 ppg LOT is a valid LOT as the drilling mud was injected into the formation. The lost circulation while displacing the 13 3/8" casing cement slurry did not have any negative results on the LOT. Since the 16.4 ppg LOT attained was equal to the proposed LOT for the 11 ¾" shoe at a depth of 6537 ft the 11 ¾" liner would only be run as a contingency.

The section on Well Control specifies the well should be shut in the event of a kick. A hard shut in is acceptable and the well shall be killed with the Driller's Method.

2.2 Lost Circulation

The drilling program did not specify a contingency plan if lost circulation was encountered attempting to determine the optimum setting depth for the 9 5/8" casing. It addresses lost circulation while drill 8 ½" hole through the Kujung and it specifies that two pumps should be lined up on the annulus to fill the hole in case total losses were encountered.

2.3 Kick Origin

The influx of formation fluids into the wellbore occurred during the 27 minutes from the time the fluid level dropped in the annulus until circulation was regained. This assumption is based on the following:

- The 64.3 bbls of gain while pulling out of the hole was offset by the 282.3 bbls of 14.7 ppg mud pumped down the drill pipe during the trip. This is 4.7 times more than required therefore any gain after commencing the trip would have been pumped back into the formation;

- The pump pressure declined slowly for the first 91 bbls while pumping the 14.7 ppg mud into the drill string. This is an indication that the mud is being pulled from the drill string by the flow in the annulus as it should increase as the annulus fluid level is increasing;

- The pump pressure increased steadily the last 120 bbls at pump rates of 120 and 175 spm. Just prior to regaining circulation the pressure increased with a decrease in pump rate;

- It took approximately 90 stokes to fill the drill string (8 bbls) when the pumping of the LCM pill commenced 35 minutes after shutting the pumps in after filling the hole. This calculates to a fluid level of 456 ft in the drill string.

- Since the annulus remained static during this time the annulus EMW is less that the 14.7 ppg mud in the drill string.

There is no way to estimate the amount of influx as there is no accurate data to calculate the BHP, The only estimate is the 8 bbls required to fill the drill pipe when pumping the LCM Pill. The following table is a calculation of the kick size for formation pressures from 14.2 to 13.6 ppg assuming an influx of water at 8.5ppg :

Formation Pressure in EMW (ppg)	14.2	14.0	13.8	13.6
Bottom Hole Pressure (psi)	6865	6768	6762	6575
Influx Height (ft)	749.8	1049.7	1349.6	1649.5
Influx Volume (bbls)	41	57.4	73.8	90.3

2.4 Trip

The trip commenced at 23:15 hours but the hole did not take the correct displacement at any time while pulling pipe. A trip sheet to record hole fill up for pipe displacement was not used as they were instructed to pump out of the hole. The active mud volume based on the PVT system readings is assumed to be accurate as the decrease in the pit volume compared to the calculated volume based on the stroke counter is fairly consistent. The first 5 stands were pulled without pumping and the PVT measured a 5 bbl gain. The next four stands were pumped out. They pumped a total of 107.2 bbls which was about 100 bbls more than was required by pipe displacement. The excess amount was due to the pump rate of 40 spm (3.6 bpm) and the time required to pull the 4 stands.

After this the operation consisted of pulling 5 to 7 stands which resulted in a pit gain of 5 to 10 bbls. Then pumping an excessive mount of mud, a minimum of three times as much every time they pumped. At 6:23hours, a depth of 4623ft, the well started to flow as a pit gain of 34 bbls occurred while pulling 2 stands. The next stand was pumped out and 42 bbls of mud was pumped in at 40 spm. The PVT measured a gain of 114 bbls. This made the total gain of 148 bbls while pulling the 3 stands in a time of over 31 minutes.

The gas arrived at surface at 6:56 hours and after the gas decreased they continued pumping at 40 spm and pulled an additional stand. It was recorded on the Mud Logging Unit recorders that they called the Company man at 7:19 hours which was 44 minutes after the well started to flow. The well was shut in at 7:53 which was a total of 90 minutes after the well started to flow.

3 CONCLUSION

The following conclusions are based on reviewing the drilling reports, the drilling program and the Mud Logging data and no effort has been made to verify the individual statements from the persons involved:

The majority of the third party services contracted for the Integrated Drilling Management contract were reputable companies and except for the mechanical problems with the rig and the solids control equipment the performance appears to be satisfactory;

The Drilling Program was above average and the anticipated drilling problems for each hole size and the mitigating action to be taken for each was addressed. Total losses when attempting to locate the top of the Kujung was not specifically addressed in the 12 ¼” hole section but it was addressed for drilling 8 ½” hole section;

The casing design was based on anticipated pore pressure, fracture gradient and mud weight for the offset well. The pressure came in higher than expected which resulted in the setting of the 16" and 13 3/8" casing strings higher. The determination of the casing setting depth was done in all cases without sacrificing the Kick Tolerance Safety factors;

The decision to omit the 11 ¾" drilling liner because the 16.4 ppg LOT on the 13 3/8" shoe was equal to the proposed 11 ¾" shoe LOT was not a factor. The decision was made based on setting the 9 5/8" casing at 8500 feet, but even with the increase in depth to 9297 feet the Kick Tolerance of an 8 bbl gain with a 0.5 psi safety factor was acceptable;

The kick was the result of taking an influx of at least 57 bbls of gas and water while trying to fill the hole down the drill pipe after losing circulation. The Drilling Program "**stated have pumps lined up on the annulus to fill the hole in case total losses occur when fractures were encountered in the Kujung formation**";

The detection of the influx was more difficult because of the synthetic OBM. The gas will remain in solution until the hydrostatic pressure is equal to the bubble point and then it expands rapidly which will unload the hole and allows for a kick from the formation;

If the Drilling Program had a provision for filling the annulus with a lighter weight mud as soon as losses occurred the influx would of remained at the bottom of the hole and in most cases would have been pushed back into the formation by filling the annulus;

If the losses continued the annulus should have been filled with water until a fluid level could of been established which would allow for the calculation of formation pressure and the necessary mud weight;

The well filled up prior to taking any remedial action to cure the losses and the drill string took approximately 8 bbls to fill up 35 minutes later. This is a rough estimate of a 14.0 ppg formation pressure;

The well remained static for approximately 7 hours while building mud volume but no attempt was made to circulate bottoms up prior to pulling out of the hole. If they circulated bottoms up the prior to leaving bottom the influx would of been detected;

The procedure used to fill the hole during the trip is not standard operational procedure but the pumping of an excess amount of mud for each section would of allowed the trip to be completed if the influx had not occurred prior to commencing the trip out of the hole;

The initial flow rate was of 34 bbls in 8 minutes is equal to 255 bbls per hour was due to the expansion of the gas that was absorbed by the Oil Based mud.

The failure to shut the well in instantly as was specified in the drilling program allowed the well to flow a minimum of 733 bbls prior to shutting the well in. This is equivalent to a over 5000 ft of 12 ¼" hole;

The Shut in Pressures recorded when the well was shut in after a 733 bbl gain are too low which indicates something broke down as soon as the well was shut in;

The large gain prior to shutting the well in means the interval from the shoe 3580 ft to 6768 ft is exposed to a pressure in excess of the 16.4 ppg fracture gradient assuming an equivalent bottom hole pressure of 14.0 ppg with an influx of water;

The LOT on the 13 3/8" shoe indicates the shoe is competent and a shoe at 3580 ft is considered to be sufficient to prevent a well broaching to surface but the well broached to surface in less than 20 hours;