

Conference Call Transcript

Edelweiss Securities Limited

Understanding geological complexities and reserves
accounting in Oil & Gas

June 25, 2012 | 05:30 p.m. IST

Corporate Participants

Mr. S K Majumdar
Industry Expert (Oil and Gas)

Mr. Niraj Mansingka
Analyst, Edelweiss Securities Limited

Questions and Answers

Moderator: Ladies and gentlemen good day and welcome to the Edelweiss Securities Limited Conference Call on understanding reserves accounting in oil and gas and how reservoir complexity influence them. As a reminder all participant lines will be in the listen only mode. There will be an opportunity for you to ask questions at the end of today's presentation. If you should you need assistance during this conference call you please signal an operator by pressing "*" and then "0" on your touch tone telephone. I would like to hand the conference over to Mr. Niraj Mansingka. Thank you and over to you sir.

Niraj Mansingka: Thank you Marina and good evening to you all on behalf of Edelweiss in the conference call on oil and gas reserves accounting, how a complexity influenced them. Today we have with us industry veteran and specialist Mr. SK Majumdar. Mr. SK Majumdar is oil and gas expert and he is currently consulting for Assam Oil Company. He is a geologist and had over four decades of experience in the oil and gas industry. Earlier he has worked as an Executive Director in ONGC looking at the Assam Assets. Mr. Majumdar will present his thought on how the reserves are booked, water resources sales, when the commerciality turn and how the government approvals need to change in the reserves and also touch base on how the complexities of various fields need to change it in the reserves. I am sure people would like to hear that because of the changes that happened recently. Mr. Majumdar thank you very much for being in the call, over to you sir.

SK Majumdar: Good afternoon to all our listeners. So the topic that I am going to cover is essentially a generalized topic. I am going to talk about the geology and the reserves, how it is calculated, what are the possible complications associated and how it is best taken care of in the industry. To start with as you know when you start doing exploration in a particular basin, any investor would like to know, like how much it is really worth before investing any amount into this and this is the front in which we say we carry out the resource analysis, essentially it is called the prognosticated resources, that is what is the best amount of hydrocarbon that this particular basin can contain and the best combination of situations as can be expected. This is essentially a geo-scientific exercise, where I look at the tectonic history of the basin, the basin field and the kind of evolution that it has gone through. When you talk about the tectonic history that is essentially the movements within the basin that creates the depressions and which contains all this kind of sediments. The second aspect as we said is the kind of basin field like where they are going to have some kind of plastic inputs, what we mean is, the moment certain depressions are created lots of sediments are carried into it through different means mainly by rivers and any other means so that is called a kind of plastic field. You can also have a situation when there are no plastic inputs and the area is inundated with sea and there are carbonates which are dropping out and precipitated. Then you

have a situation when there are no depositions at all and the whole area is elevated and kind of eroded and that we refer to as a kind of unconformity surfaces. Each one of these phenomena has a major contribution towards development of oil and gas accumulations within the basin. So this is the first phase where we try to look in to and each one of these phenomena is studied and kind of classified and put together and that's how what we get is the prognostication of resources.

As we can understand this is supposed to be more of an interim analysis and here we really do not look for a very high level of clarity, nevertheless this is our starting point that we look at the prognosticated resources, accordingly decide our exploration program and go ahead. As the time proceeds we gradually go for the conversion of these particular resources into higher categories. The total conversion is never possible but what we try to do is we try to look at it regionally into different domains of this particular basin and we try to identify the prospects and the place as they are referred to. Now each one of these are firmed up through different geo-scientific studies essentially seismic and all other exploration technologies, the number of methods are available today. In that process we firm up these different prospects in place. And the moment that is done we kind of firm up the different prospects for exploration and that is how the first phase of exploration starts and the resources gradually get converted into reserves. Now what is the definition of reserve? Let us try to go at it carefully. The reserves first of all there are four criteria which it needs to fulfill. There must be the discovered ones, they must be recoverable, they must be commercial and they must be remaining as on the date of evaluation did. Based on these particular criteria we try to convert these particular resources into reserves. Now once the reserves have been established the question comes, I mean here really commerciality is gradually coming into the picture so we need to look at the different methods of calculation of reserves. This is where a lot of attention is paid because we are trying to go for more specific investments into the development of this particular reserves. Though the first term, the first method that we have apply to all such reserves are to the conversions is referred to the volumetric method. What we really do is we look at the aerial distribution of the so-called prospects that we have identified. We must have sampled some of them by now so you have some of those sub-surface parameters like porosity, permeability, hydrocarbon saturation these are the parameters which we try to spread all over this particular area and then we calculate as what is called a volumetric reserves. Now this volumetric reserves calculation the first chapter, it is a must for any prospect to go ahead. As time goes by we would like to have more precise information of this particular volumetric reserves and how are they going to be exploited over a period of time. So with the passage of time as we have done some more drilling work within these particular prospects we start getting more information about these reserves and their behavior and from there we are able to really zero in on their commerciality and the quantity that could be available for use in the market. So the methods that are used for the clarity of the information are referred to through decline carbs method that means essentially the pressure production

history. As the time passes by gradually the pressures are supposed to be coming down and we see the production also is gradually goes down. It is a very natural phenomena, it happens to all the reserves but when does it happens is more important. So by critically analyzing this particular history of decline carbs we are in a position to talk about the limits of this particular reserve. The subsequent phase of clarity that comes is through material balance methods. Essentially what we do here is we try to look for the amount of production that has already taken place over a certain drop of pressure of the reservoir and try to extrapolate this particular information for the future to account to a particular value of reserves which can be anticipated from the remaining results that is left behind. This particular information is again further updated or kind of further clarity can be put into it, better resolution can be put into this particular information by doing reservoir modeling. This modeling also could be up to different types, that is the static reservoir modeling where we look at the distribution of geology all over the reservoir and this is a dynamic modeling what that really deals with it, you have the behavior of the hydrocarbons present within the reservoir and how it is changing its character in the process of pressure depletion. So both this particular things are put into and a material balance calculation is carried out. Then we further improve upon on these reserves calculations through the process of simulation. This is nothing else but through computer we try to generate simulate the conditions which are existing in the reservoir, essentially again putting in all the available parameters, porosity, permeability, the viscosity of the fluids and the existing situation in the sub-surface that is temperature and pressure and try to predict its future. Through all these particular methods essentially we are trying to refine the quality, the amount of particular reserves that could be available in the sub-surface or projection to the future performance. Even after doing all this, the whole issue as you must have realized by now is subjective because a number of parameters are involved, not all of them can be perfectly measured when a particular field is in production. So the ultimate analysis of change that is the production, performance analysis, this is analysis of change in the production rate and production fluid ratios that is GOR gas-oil ratio, gas condensation ratio, water oil ratio, etc., and the water bowl and flowing pressures that could be extrapolated to an economic limit conditions to estimate reserves. So these are the different standard methods for calculation of reserves, once a particular resource has been converted into reserves.

Next thing I would like to talk about are the system of calculations. As on date at least there are nine standard methods of calculation of reserves. Now depending upon which part of the corner you are situated in, different methods are adopted for calculation of the reserves to the maximum category. Then out of these different types of reserves, there are certain which are controlled by security considerations. There are three such systems which are incorporated in this particular category one is of course, SEC, the security and exchange control that is practiced by the USA, then you have a Canadian system 51, 102 and then you have a system in UK called USOR - these are the ones which directs you to exercise certain security conditions that means they have certain rigid

parameters to go by only if it fulfills those particular criteria then only their particular accumulation is considered as a reserve, in spite of the fact that it has been discovered and it fulfills all the rest of criteria that we talked about. Then we have certain other systems like Russian system, then we have a Norwegian Petroleum Directorate, we have an Australian system and there is an Indonesian system. These are also practiced in the respected parts of the world and very much in vogue. Then we have certain international systems, one is adopted by the UN and there is the very latest one which is supposed to be the most popular and most commonly adopted today all over the world that refers to as PRMS 2007, this is one particular system of calculation of reserves establish or rather standardized in 2007 by a particular committee made up of WPC, World Petroleum Council, SPE, Society of Petroleum Engineers, AAPG American Association of Petroleum Geologists and SPEE, Society Petroleum Evaluation Engineers. This is the latest acceptable method of calculation of reserves and resources for commercial application and this particular method in fact is still under development in the sense, lot of fresh inputs are coming into this particular system, almost every other day to further fine tune and represent that reserves are at particular basin. Now BPO, what are these particular systems. I will talk about only this PRMS system as we talked about here we talk about the discovered and the undiscovered components. Why both these components? The discovered component is the one which directly helps you to have economic considerations and other considerations are really not left out into this. Then we have a second which is undiscovered, this is what is referred to as a prospective resources. Now coming to the reserves part of it, we divide them into three different categories, they are called proved, probable and possible. Now proved is referred to as P, probable plus proof both of them when they are accounted together that is called 2P and possible that this prove plus probable plus possible all the people together are referred to as 3P. For all economic calculations or projection of investment, it is always that 2P reserves which are referred to, that is supposed to be most likely reserves in this particular field. Then again within the category of discovered reserves we do have a category which is called contingent resources, though it is not a reserve, it is referred to as a contingent resource. The formal definition of a particular contingent resource is like this, its a quantities of petroleum estimated in an accumulation but they applied projects are not yet considered mature enough for commercial development due to one or more contingencies. What are those contingencies? Like this particular reserves or the contingent resources could be located in an isolated area and commercially not viable, then you do not have a development plan ready for it or the technology under development is not yet fully finalized or formalized or the data accumulation, evaluation of the accumulation is insufficient to clearly assess the commerciality, this contingent resource categories are once again categorized into the same three categories we call it 1C, 2C and 3C on similar lines as we said as proved, probable and possible. Obviously 2C is the right kind of amount to be used for all further planning purposes. In addition to these two categories we do have a third category which as we said essentially referred to as prospective resources. This

is essentially an upside, this is of course not brought in into the economic considerations directly but they are very much in the horizon. In case you are thinking of developing this particular field especially when it is a massive one, we do need to take into consideration this particular amount which is referred to as a prospective resources, this is calculated again in three different categories. Essentially it is through probabilistic means and we see accordingly the P90, P50 and P10. P90 this is supposed to be a rather pessimistic assessment of the upside but as the very name implies P90 means there are 90% chances that we are going to achieve it. The next one is P50 as the very name implies this is called the most likely resources and the chances of getting it are to the tune of 50%. This is again the utmost common variety which is used for our extrapolation of upside and calculations thereof. P90 as you would realize it is rather optimistic and there are 10% chances of it being available. Now complications in reserves calculation that very often develops and we have come across in many situations in the past, what readily comes to my mind is one such instance that happened in the shale which lead to writing up a good part of their reserves and, of course, there are people who are responsible but such phenomena does happens, anyone who is concerned with this particular phenomena would realize. This comes, as we have tried to explain by now, that the moment we try to proceed with the developed into particular reserves, fresh amount of information does comes through and there are many surprises which often comes, which leads to writing off part of the reserves because of reasons of discontinuity, because of poor porosity, permeability situations, because of presence of a particular fault and its behavior during the presence of production. Not that these things are permanently written off but more often there are certain special techniques which are adopted which becomes available to the operator the moment he has a greater insight into the distribution and its rest of the setups. So this way this is often addressed. I think with this broadly I have addressed the issues that we wanted to tell you about. Thank you.

Moderator: Ladies and gentlemen we will now begin the question and answer session. The first question is from Rishabh Tambi from HDFC Limited. Please go ahead.

Rishabh Tambi: I would like to ask for doing valuation of any oil company, we should go for this 2P probable plus proved resources or 3P or 1P. What is the criteria for this?

SK Majumdar: The P essentially talks about your degree of confidence about the reserves that have been calculated. Once we say it is proved that it is P, that means all the related parameters have already been seen and worked out and we are pretty confident about the availability. When we are talking about 2P, that is proved plus probable, probable is the area where you have certain parameters still to come in, though broadly you have the knowledge of this particular reserves, it is recoverable, it is very much existing but there are certain grey areas. So for all our practical purposes, for our planning we use 2P, which is the most likely amount of reserves going to be available.

Moderator: Thank you. The next question is from Narendra K Raman from

Sanlam. Please go ahead.

Narendra K Raman: While reading into these numbers of P or 2P say from the Annual Report of companies, I would just like to understand where do this regulatory board come and what is their effort in appraising or certifying these reserves? Can I just pick up this number of the Annual Reports and say apply or decline curve. I just want your thoughts on that?

SK Majumdar: First of all the moment this particular reserves had been firmed up in whatever category that they are, this is put up to the regulatory body, they should be convinced like whether the parameters that have been chosen and the particular testing that have been done whether they are convincing enough and they are satisfied that this really reflects the real situation at the ground level. Have I answered your questions?

Narendra K Raman: If I would ask more specifically how would you say this revision of resource as in the case of RIL say from 10 trillion cubic feet of gas to 1 plus, so where was the laxity because as an analyst I was understanding the 10 trillion cubic feet, say if it was 2 trillion now they integrated to 1 trillion cubic feet?

SK Majumdar: I am afraid I will not be able to address your specific question because I am not privy to that particular data but what all I can tell you is that phenomena and that is what I was trying to quote during the discussions during my presentation. But these things do happen in the industry, the reason being, once you have calculated the first curve of calculation is the volume metric reserves, that means you are seeing that particular prospect of the plane and whatever surface that you have mapped. How? Through geological and geophysical means, there are today exploration technologies available, you can see the range of distribution what can form a reserve. Now once you have started producing over a period of time as I again tried to explain, it is a production performance analysis, how it is going to behave. When you upload it on system production you find a good amount of it is not responding to the particular exploitation schedule. Why? There could be a break in between. There could be a deterioration of phases in between which is not permitting the flow of that particular gas into the bore hole in the present system. So it is not that it is loss to us forever in case you are pretty convinced about the availability of that particular reservoir there are different methods to address them, to approach them and kind of make them commercial.

Narendra K Raman: My last question would be specifically on the decline curve which is function of basically historical decline curve plus the new exploration done. I would like to understand if there are marked difference between a decline curve for an oil field and a gas field, if you can just tell any difference at all between them, or should I treat them all in the same way?

SK Majumdar: Not really, all these oil fields and gas fields, existing is gas has a very high mobility as you know compared to oil so I would expect that particular oil field caps are comparatively smoother in the sense that recovery takes a good lot of time compared to a gas field where the recovery is good and the

recovery is faster and then when you look at this particular decline curve since they speak a lot of story in case you have some kind of resistance to the smooth flow you can see it coming up on the decline curve very well over a period of time. So with the passage of time that particular fault that means a break in the continuity is becoming prominent, it is becoming a barrier. So these kinds of things are projected into the decline curve.

Moderator: Thank you. The next question is from Kiran Tulasi from Edelweiss Institutional Equities. Please go ahead.

Kiran Tulasi: My question is regarding results say in a field where we have some reserves in a stratified channel, like the way we find reserves in RIL where some of the reserves are not in a main field but in a channel adjoining that. So in a general case can you explain how do you account for these reserves and whether these reserves can be rebooked or can they be cancelled later on?

SK Majumdar: In fact when I said the terms like prospect and place in case you have heard that, these really refer to the particular features. The accumulation in the basin or wherever you have them, they are essentially in the form of reservoirs. They are the habitat of oil and gas. What really you are looking for into that one? Of course, first thing is you need some source rocks which generates oil and gas then you need some porous and permeable areas that is called the reservoir rock, that is essentially the habitat, that contains the oil and gas then you need a kind of cap so that this oil and gas does not flow away elsewhere. They are supposed to be highly mobile. So a combination of these three situations form what is called a trap. Now what is this trap? This particular porous permeable section contained under this particular situations it maybe in the form of a pod born by a particular fault or some such feature which is localized or it can be a channel as you said, the channel means that is a one particular linear feature which contains a lot of sand, which is supposed to be porous and permeable and it is charged with hydrocarbon that is all a gas. Now the distribution of this particular channel as I was trying to explain in the last question, it is ideally visible through the geo scientific technology which is available to us today. You can see the Ariel distribution of this. But as you try to put it into production you will automatically come up. Invariably it happens more or less but there are certain barriers which are essentially surprises. They are the ones which form temporary constraints to the long-term production plan but if you can diagnose it, you can trace it properly there has to be a separate plan, there is lot of negotiate these ones and bring them back into on stream.

Kiran Tulasi: My next question is regarding the impact of government approvals. Generally we see that there is a big gap between the time when the operator applies for a DOC and when the government approves it. And also same is the case for the field development plans. Are reserves accounted keeping in mind the chances of say government approval of the development plan and in the same way our resource accounted keeping in mind the commerciality of the reserves?

SK Majumdar: It is not really that way. There are groups of people. In fact they are also available in the markets who are supposed to be experts in the

assessment. So as far as the data, if there is a complete set of data available the most expert assessment is carried out and certain values are arrived. Now second part as you know is government approval. That is really something on which I should not be talking about, they have their set of people, of course, they also follow the same standard sets of norms I would believe so and then approval comes in due course of time. But as far as the operator is concerned once he is convinced that he has a particular amount of reserves to go by, he automatically plans for the resources accordingly of course, at the end of the day he has got to have the government approval to go ahead otherwise as you know there is no cost recovery.

Moderator: Thank you. The next question is from Saeed Jaffrey from Premji Invest. Please go ahead.

Saeed Jaffrey: Good evening sir. The first question is while you are in the appraisal phase post the exploration phase when you are appraising a reservoir, at that point in time is it possible for you to understand the geology in terms of whether the reservoir, the ponds are they connected or they are not connected or is it that you get to know about these things only when production commences?

SK Majumdar: It is a matter of degree of resolution, as I was trying to point out to you, this degree of resolution can improve as you probe deeper into this. The first phase of probing is of course, through your geo-scientific, that means we look at the world data, we look at the seismic very critically. There are certain standard procedures are also there, by all this we can come to a particular resolution which may be 50 meters, 100 meter, I am sure to that extent things are like this but when you go to the behavior of the reservoir that comes only at the phase of appraisal. How exactly it is going to behave with the passage in time. What happens this particular sediments as I was trying to tell you the porous, permeable sections or the particular sediments which are of interest from the hydrocarbon accumulation some point, they are never uniformly deposited, this is essentially a phenomena of deposition or let us say precipitation of carbonate. This method somehow does not behave in a typical uniform manner so you do have certain irregularities. How exactly it is going to behave in the sense of sustained production that has to be seen over a period of time to be sure.

Saeed Jaffrey: So what are the chances to know about the connectivity between reservoirs? Are the chances higher that you will know about the connectivity of the reservoir during appraisal or things can materially change once production starts?

SK Majumdar: If the appraisal is very thorough.

Saeed Jaffrey: If the appraisal is very thorough, you should have a very good idea in terms of whether connectivity is there, is it?

SK Majumdar: Let me try to illustrate in a manner, supposing you have a reservoir spread over some 50 km² fairly large zone, now in nature you would not expect all this 50 km² shall be having uniform porosity, permeability,

saturation conditions. It does vary from place to place so what happens right at the initial phase that is why I talked about reservoir modeling, at that phase of modeling we try to discreetly divide this particular 50 km² area into different discreet blocks which are having uniform parameters. So if you have done it very thoroughly at this stage yes those particular discrete blocks have already been identified and once you have sampled each one of these discrete blocks, yes, you have a good command over the particular phenomenon but more often what happens, for obvious reasons most of them are commercial in fact, you don't wait that long, you go ahead and start having the cash flow to be sure and gradually develop rest of the blocks and that is how these kind of unwarranted complications that develops during the appraisal phase.

Saeed Jaffrey: Then one would see that if you come across major complications in terms of your reservoir, things related reservoir connectivity and channel, it is more a function of some lapses at the appraisal stage. Is that a fair comment to make?

SK Majumdar: No, it is not, I won't call it an appraisal lapse, this is a kind of routine that goes on as you try to be as perfect as the data permits you and then, of course, the commercial exploitation starts because you need to get back your money, earlier the better.

Saeed Jaffrey: Now that you have understood that reservoir channels are not connected so to that extent these are separate pools now. Once you do that, there are technologies existent today to connect them and get most out of the field, most of the reserves that are there because now these are separate pools. Are these like existing technologies available to maximize recovery?

SK Majumdar: Yes, a mention is made about the particular phenomena called contingent resources; I made a mention of it in fact. These contingent resources are discovered category though it is called a resource actually it is a reserve as I mentioned. Now what happens, you cannot put them into production tomorrow because you do not have a developing plant because the existing technology does not permit you to do that, etc., all those classifications are there. So these categories as you said the one which is separated, they have been very eagerly put into the category of contingent resources that is the reserve which is technically feasible but not commercially viable at this point of time. You have technologies through dilution building or maybe through independently developed in that one, there are a number of things which are coming into the industry today by which yes, it becomes possible to produce them commercially.

Niraj Mansingka: This is Niraj, just wanted to ask a question, take an example if there are two basically pools in a particular reservoir and at a later on stage it comes out that if they are disconnected, will the operator have to cut the reserves because what they estimated earlier was a connection between two poles and later on when they started production it led to a reality that those pools are not connected. So how do you see the reserves getting changed because of this?

SK Majumdar: Once you have a phenomena like that you are obliged to cut the

reserves and maybe the rest part of the reserves is categorized as contingent resources. That is the usual practice it does happen many a times in the development of fields.

Niraj Mansingka: The last thing I want to know is what is reservoir shrinkage and does it also lead to cut reserves and any example of that happening in India?

SK Majumdar: Reservoir shrinkage as you know this particular things once it is charged with oil and gas that the whole thing is under certain amount of pressure and these particular reservoir post pressures when you go to those particular levels they are supposed to be under tension. When you continue with the development rather production exploitation of oil and gas obviously, that particular tension is removed. So you do have reservoir shrinkage it is very much a phenomena associated with any reservoir anywhere, it is natural.

Niraj Mansingka: One more question related with the first one that I just asked, when you said they will have to be cut and moved to contingent that contagion definition would be in the hand of operators to define how it is or will it be generally governed by some government?

SK Majumdar: Yes, it has to go through the government's knowledge, the moment you try to put up the data as I said, those decline curves, the simulation, the reservoir modeling all the data would be available to the government also so they have to be judicious choice onto this and the decision.

Niraj Mansingka: But it can be contingent even go to the prospective level as well?

SK Majumdar: Not prospective, contingent, the essential difference between other resources and contingent resources is that contingent resources are already discovered quantity nor the other resources.

Moderator: As there are no further questions from the participants I now hand the conference over to Mr. Niraj Mansingka for closing comments.

Niraj Mansingka: Thank everybody and especially Mr. Majumdar taking out time to speak to the investors who were very curious to know about how the reservoir accounting has done. Hope, this would have helped us to get some understanding of the same. Thank you very much.

Moderator: Thank you very much. On the half of Edelweiss Securities Limited that concludes this conference call. Thank you for joining us and you may now disconnect your lines. Thank you.

Disclaimer

General Disclaimer:

This document has been prepared by Edelweiss Securities Limited (Edelweiss). Edelweiss, its holding company and associate companies are a full service, integrated investment banking, portfolio management and brokerage group. Our research analysts and sales persons provide important input into our investment banking activities. This document does not constitute an offer or solicitation for the purchase or sale of any financial instrument or as an official confirmation of any transaction. The information contained herein is from publicly available data or other sources believed to be reliable, but we do not represent that it is accurate or complete and it should not be relied on as such. Edelweiss or any of its affiliates/ group companies shall not be in any way responsible for any loss or damage that may arise to any person from any inadvertent error in the information contained in this report. This document is provided for assistance only and is not intended to be and must not alone be taken as the basis for an investment decision. The user assumes the entire risk of any use made of this information. Each recipient of this document should make such investigation as it deems necessary to arrive at an independent evaluation of an investment in the securities of companies referred to in this document (including the merits and risks involved), and should consult his own advisors to determine the merits and risks of such investment. The investment discussed or views expressed may not be suitable for all investors. We and our affiliates, group companies, officers, directors, and employees may: (a) from time to time, have long or short positions in, and buy or sell the securities thereof, of company (ies) mentioned herein or (b) be engaged in any other transaction involving such securities and earn brokerage or other compensation or act as advisor or lender/borrower to such company (ies) or have other potential conflict of interest with respect to any recommendation and related information and opinions. This information is strictly confidential and is being furnished to you solely for your information. This information should not be reproduced or redistributed or passed on directly or indirectly in any form to any other person or published, copied, in whole or in part, for any purpose. This report is not directed or intended for distribution to, or use by, any person or entity who is a citizen or resident of or located in any locality, state, country or other jurisdiction, where such distribution, publication, availability or use would be contrary to law, regulation or which would subject Edelweiss and affiliates/ group companies to any registration or licensing requirements within such jurisdiction. The distribution of this document in certain jurisdictions may be restricted by law, and persons in whose possession this document comes, should inform themselves about and observe, any such restrictions. The information given in this document is as of the date of this report and there can be no assurance that future results or events will be consistent with this information. This information is subject to change without any prior notice. Edelweiss reserves the right to make modifications and alterations to this statement as may be required from time to time. However, Edelweiss is under no obligation to update or keep the information current. Nevertheless, Edelweiss is committed to providing independent and transparent recommendation to its client and would be happy to provide any information in response to specific client queries. Neither Edelweiss nor any of its affiliates, group companies, directors, employees, agents or representatives shall be liable for any damages whether direct, indirect, special or consequential including lost revenue or lost profits that may arise from or in connection with the use of the information. Past performance is not necessarily a guide to future performance. The disclosures of interest statements incorporated in this document are provided solely to enhance the transparency and should not be treated as endorsement of the views expressed in the report. Edelweiss Securities Limited generally prohibits its analysts, persons reporting to analysts and their dependents from maintaining a financial interest in the securities or derivatives of any companies that the analysts cover. The information provided in this document remains, unless otherwise stated, the copyright of Edelweiss. All layout, design, original artwork, concepts and other Intellectual Properties, remains the property and copyright Edelweiss and may not be used in any form or for any purpose whatsoever by any party without the express written permission of the copyright holders.

Analyst Certification:

The analyst for this report certifies that all of the views expressed in this report accurately reflect his or her personal views about the subject company or companies and its or their securities, and no part of his or her compensation was, is or will be, directly or indirectly related to specific recommendations or views expressed in this report.

Analyst holding in the stock: No.

Additional Disclaimer for U.S. Persons

This research report is a product of Edelweiss Securities Limited, which is the employer of the research analyst(s) who has prepared the research report. The research analyst(s) preparing the research report is/are resident outside the United States (U.S.) and are not associated persons of any U.S. regulated broker-dealer and therefore the analyst(s) is/are not subject to supervision by a U.S. broker-dealer, and is/are not required to satisfy the regulatory licensing requirements of FINRA or required to otherwise comply with U.S. rules or regulations regarding, among other things, communications with a subject company, public appearances and trading securities held by a research analyst account.

This report is intended for distribution by Edelweiss Securities Limited only to "Major Institutional Investors" as defined by Rule 15a-6(b)(4) of the U.S. Securities and Exchange Act, 1934 (the Exchange Act) and interpretations thereof by U.S. Securities and Exchange Commission (SEC) in reliance on Rule 15a-6(a)(2). If the recipient of this report is not a Major Institutional Investor as specified above, then it should not act upon this report and return the same to the sender. Further, this report may not be copied, duplicated and/or transmitted onward to any U.S. person, which is not the Major Institutional Investor.

In reliance on the exemption from registration provided by Rule 15a-6 of the Exchange Act and interpretations thereof by the SEC in order to conduct certain business with Major Institutional Investors, Edelweiss Securities Limited has entered into an agreement with a U.S. registered broker-dealer, Marco Polo Securities Inc. ("Marco Polo").

Transactions in securities discussed in this research report should be effected through Marco Polo or another U.S. registered broker dealer.