Minutes of EPA Region Reserves Challenge Session, 19 November 2003

Format & Participation

Challenge session held as a virtual meeting via teleconference and Netmeeting over 3 hours (2 – 5 pm Malaysia time) on 19/11/03.

Participation was as follows:

**Rijswijk**  
John Pay, Group Reserves Coordinator  
Lim Min Teong, Group RE Discipline Head  

**Singapore**  
Brian Straub, EPA Technical Director  

**Malaysia**  
John Sutherland, SM-EP and EPA Reserves Coordinator  
Tho Hui Tsin, SM-EP and EPA Reserves Assistant  
Tan Teck Choon, Snr rep Sabah business unit  
Martin Ipelman, Snr rep Sarawak business unit/ EPA RE Discipline Head  
Paul Vledder, Sarawak reserves coordinator  
Stanley Kueh, NOV reserves coordinator  
Heng Hiok Boon, Area Development Leader NOV/ China/ Pakistan  
Bart van de Leemput, EPA Development Manager  

**Brunei**  
Lai Vui Leong, Reserves Coordinator  
Werner Ribul, RE Head West asset unit  
Dan van Nispen, RE Champion SE  
Anco Maan (for Yap Sin Fah, RE Head East asset unit)  
Kenneth Newn, Head RE Land asset unit  
Louis Huizenga, RE Discipline Head/ Head West asset unit  

**Australia**  
Sarah Bell, Reserves Coordinator  

**New Zealand**  
Steve Pannett, Reserves Coordinator  
Roland Stoltz, Chief PE  
Dave Hawton, Development Manager  
Ante Frens, Area Development Leader Australia/ New Zealand  

**China**  
Frans Deckers, Reserves Coordinator/ Technical Services Manager  

**Thailand**  
Olivier Lepine, Reserves Coordinator

Osman Tosun (Philippines), Gijs Maier & Ali Khan (Pakistan), and Rory Rogers (Deepwater Borneo) were unable to participate. Separate sessions will be held as appropriate for these OUs.

Pulak Khisha & Heiner Gulbis (Bangladesh) participation was not required in view of upcoming divestment of assets to Cairn.

The agenda for the session was as follows:

1. Introduction & Objectives
2. EPA Summary
3. New Zealand (STOS)
4. Australia (SDA)
5. China (SCEPCO)
7. Brunei (BSP)
8. Thailand (TSEP)
9. Conclusions/ Wrap-up

Introduction & Objectives

Regional reserves challenge sessions are a fundamental part of the hydrocarbon resource volume maturation process, and are required on an annual basis with the objective of assuring that volumes reported in the ARPR are robust and consistent with Group and SEC guidelines. Target timing for the challenge sessions should be around late Q3, after BP submission, to allow adequate time to mature follow-up actions for ARPR input. This is the first reserves challenge session for the EPA region.

After opening the session with an introduction to the region, each OU is required to present the significant proved reserves changes proposed for the year, i.e. those changes above 5 MMboe Group Entitlement Share (GES) or Shell Share (SS). OUs are also required to provide a summary of key issues, including opportunities and exposures, relating to their proved reserves base. As this is the first session for EPA, and to help regional staff get up to speed in their new roles, OUs could (subject to meeting cap at 3 hours) give additional background on the overall changes proposed to their proved reserves base.

Should the challenge session highlight issues, then it is not the objective to resolve the issues during the session, but to flag the issues and to resolve them offline. It was agreed that the EPA reserves coordinator is responsible for ensuring actions from the challenge session are followed up and concluded for ARPR reporting.

EPA Summary

The distribution of proved reserves in EPA at 1.1.03 was presented (Attachment 1), followed by the October LE for 2003 proved reserves addition (Attachments 2-4). The LE corresponds with 54% PRR. Upside exists from New Zealand (Pohokura) and Philippines (San Martin), which could take the LE to 62% PRR. The LE includes proposed downwrite in Thailand (Sirikit Main).

The significant exposures were presented (Attachment 5), viz for Brunei, Australia and New Zealand. Note the Brunei exposure volumes presented at the meeting were 100% volumes, and these have now been amended to Group Entitlement Share (GES) or Shell Share (SS), i.e. 50%. The exposures were categorised as those directly due to the new reserves booking guidelines (Attachment 6), and those that are independent of the new guidelines.

New Zealand (STOS)

Significant proved reserves additions are proposed for Pohokura (12.4 MMboe SS) and for Maui (8.2 MMboe SS). Other minor additions are proposed, giving a total LE of 24.2 MMboe if Pohokura is included. The Pokokura addition was given as upside in view of the maturity issue (development is pre-FID, and post-VAR3 work is still ongoing to conclude the FDP).
The undeveloped Pohokura gas field was taken over by Shell after the purchase of Fletcher Challenge in 2001. Proved reserves of 48 MMboe SS are carried in the books, which represents an exposure, as the planned development of the field has not reached FID. The field has been appraised, and base case modeling work has been done. VAR3 was carried out some 6 weeks ago, with simulation and scenario modeling work still required to conclude the FDP. FID is scheduled for June 2004. The proved reserves estimate for the field, calculated on probabilistic (P85) methodology, has been increased based on update to static model parameters. No gas sales contract has yet been secured. There is however a mature gas market, and little doubt appears to exist on access to this. The proposed reserves addition was supported at the challenge session, in view of the certainty in proceeding to FID. Action for STOS to make a deterministic calculation (considering SEC guidelines) of proved reserves for comparison with the probabilistic (P85) estimate.

Proved reserves increase proposed for Maui C sands following update to dynamic reservoir model, specifically from PVT update. SEPTAR (Tim Woodhead) review of this has been carried out. Reserves increase supported by challenge session.

**Australia (SDA)**

No significant change is proposed for SDA's proved reserves base (current LE shows zero change). This compares with the September/Q3 LE, which showed a proposed downgrade on Gorgon.

There is a threat on Gorgon proved reserves (3.04 Tcf SS), due to the project not having reached VAR3 and with no gas sales agreement; however, recent market developments and access to Barrow Island LNG plant strengthens justification to remain on the books. FDP work is being matured by ChevronTexaco, with VAR3 scheduled in Q1/04. Noted that the ongoing FDP work may result in reserves decrease. CNOOC equity deal may result in potential debooking of Gorgon proved reserves (69 MMboe SS) post-2004. Agreed to leave booked volumes unchanged for 1.1.04 ARPR.

**North West Shelf (NWS) Gas:** No change proposed for 2003. There is potential to increase reserves in 2004, from ongoing work particularly on Goodwyn. Potential debooking of proved reserves (46 MMboe SS) post-2004 from CNOOC equity deal. Not all proved reserves committed to contract; however, infrastructure already exists and appears little doubt buyers can be found.

Recommended to compare deterministic assessment (considering SEC guidelines) of proved reserves with the probabilistic (P85) estimates. Post-meeting note from Frans Deckers that Woodside's reserves estimates have been extensively reviewed by SIEP. Action for SDA/Sarah to summarise the work done.

**NWS Oil:** Field production performance indicates increased reserves potential. It is clear that STOIP figures have to be re-evaluated. A 3D seismic survey is currently ongoing, with results expected in 2004. Woodside are considering booking up to an additional 50 MMb (100%) proved reserves (6 MMb SS), and SDA have meeting planned with Woodside to review this. Action for SDA/Sarah to revert on outcome of Woodside meeting. Small exposure on Egret (1 MMb SS), to be left until other NWS upsides are matured.

**Laminaria:** Planned switch of FPSO power from gas to crude burning, which will result in ca 5 MMb SS proved reserves loss. No change for 1.1.04 ARPR.
China (SCEPCO)

Proposed increase to proved reserves (by 11.9 MMb SS) for Xijiang, a mature field now producing at high watercut. Licence expiry 2009/10. Reserves increase is from some 55 planned well activities (sidetracks), with some 11 per year (at USD14.4m SS capex pa), over the next 5 years. Estimated proved reserves increase of 15 MMb SS was discounted to 11.9 MMb. Activities are in firm plan, with CA commitment. Reserves increase supported by challenge session.

Malaysia (SM-EP)

LE for proved reserves addition is 82 MMboe SS, the bulk of which comes from the Baram Delta (BDO) fields, which are operated by PETRONAS Carigali.

LE for proved reserve increases from extension of BDO PSC from 2003 to 2018 (PSC signed in September 2003) is 69 MMboe SS, with 48 MMboe coming from the existing developments, and the remainder from new projects - largely in Baram field. The following Baram projects will be subjected to external VAR3/4 in the first week of December: Baram additional compression, BADP-B Rev 1, BAJT-H, BAJT-I, and BADP-G Rev 2. BADP-G Rev 1 was implemented in Q2/03. Other projects are Fairley Baram further development (1.9 MMb SS) and Siwa jet pump (0.5 MMb SS). The basis for the existing proved developed reserves figures was subject to external VAR for PSC deal in November 2002. Increases being made to the existing developed reserves base arise from additional 100 Bcf gas reserves (100%) for gas sales to PETRONAS Gas in Lutong, and from additional 50 MMb oil reserves from performance review and proved to expectation convergence (subject to ongoing internal review).

In SK307 PSC, Bakau Deep is being debooked (2.3 MMboe SS) due to lack of gas sales commitment (as was done for Tukau Timur in 2002). Bakau Deep and Tukau Timur are both non-associated gas fields in SK307.

A net increase in proved reserves of 9 MMboe SS is forecasted for Sarawak Gas, effectively due to gas supply plan optimization and largely for MLNG-Dua. Additional change to proved reserves will result from Shell entitlement changes, currently estimated at 15 MMboe SS; however, this is not captured in the LE, as the figure will certainly change when final entitlement calculations are made in late November.

No significant reserves increases are proposed for Sabah oil in 2003. Total net increase in proved reserves for Sabah in 2003 is 3.9 MMboe SS. A waterflood FDP was matured for Barton field in 2003 (VAR3 held in September, and VAR4 planned for December 2003); however, proved reserves for waterflooding have been carried in the books for a number of years, hence why no increase in reserves results for this in 2003 (in fact a net downgrade results).

Action to check effect of year-end oil/gas price on entitlement volumes.

Brunei (BSP)

Total net proved reserves increase in 2003 is forecasted at 34.0 MMboe SS. The significant increases are from Champion SE (9.4 MMboe SS), and from performance review/closing-the-gap on proved to expectation reserves for existing developments (34.0 MMboe SS). These increases are partially offset by a number of reductions (Santak disappointment, debooking of 4.6
MMbboe SS legacy volume in unconnected fields). A number of other small changes are made to the BSP proved reserves base, including addition of 1.2 MMbboe SS from Egret appraisal.

On question as to why 2003 PRA estimate (34 MMbboe SS) is low against target (61 MMbboe SS at BP02), was indicated by John Pay that BSP had accelerated some 2003 activity into 2002.

BSP proved reserves exposures amount to 54 MMbboe SS from new reserves guidelines, and 48 MMbboe SS from other/legacy bookings. Action to formulate a short term plan to manage the exposures (BSP have already initiated this).

Screening plots were used to assess the level of proved to expectation gap closing opportunity in existing BSP projects. Action for these screening plots to be applied to other existing assets across EPA to identify additional gap-closing opportunities (John S/Bart).

Presentation was made on the basis for the proved reserves increase from the Champion SE waterflood project. VAR2 has been passed, with VAR3 scheduled for Q1/04 and VAR4 in late-2004/early-2005. Tranche 2 CA project. Considered OK to book proved reserves at 1.1.04, as below VAR3 threshold (10 MMbboe SS). Action for John Pay to confirm this is OK with the Group reserves auditor, Anton Barendregt.

**Thailand (TSEP)**

TSEP proposed further debookings for Sirikit Main in 2003, on top of the debookings made in 2002. The proposed debookings cover 3 areas:

- Reduction of 15.9 MMbboe SS proved undeveloped reserves for the A Block. Reserves had been booked in 1999 on the basis of STOIP and general RF evaluation, not on FDP work. 2001/2002 drilling activity and 2002 field review have led to volumetric reduction. It is indicated that B-Block volume could increase, although this cannot be confirmed until further work is done. The Lan Krubu (LKU) reservoir is deemed unsuitable for waterflood, as evidenced by performance in other parts of the field.

- Reduction of 9.6 MMbboe SS proved undeveloped reserves for the M and P reservoir development project. The project was initially defined in 1999, involving 15 infill targets in the M reservoir, and 13 in the P. Review of this was made in 2002, resulting in 3 horizontal wells to develop M (0.55 MMstb and 0.35 Bcf), and 12 hydraulically fraced wells for P (1 MMstb and 1.08 Bcf). With wells required to develop at least 110,000 bbls to break evem, the projects are deemed uneconomic.

- Reduction of existing developed reserves by 3.9 MMbboe SS as a result of (1) performance review and (2) change in developed reserves estimation methodology (with estimates to date considered on the high side due to the nature of the triangular distribution used).

Given the overall magnitude of the proposed proved reserves debooking for Sirikit Main (29.6 MMbboe SS), review/endorsement of this should be made (as would be required if the revision was of the same magnitude but positive). Action to arrange for external review of the proposed debookings. Review is now confirmed for second week of December.

**Conclusions/ Wrap-up**

No review required on Bangladesh reserves in view of planned divestment to Cairn.
Separate meetings to be arranged as appropriate with OUs unable to be present: Philippines, Pakistan and Deepwater Borneo. Action for John S to arrange.

- For Philippines, proved reserves additions proposed from Malampaya performance (P/Z) review (16.9 MMboe SS), and from San Martin (9 MMboe SS). Action for John Pay to discuss potential for San Martin booking with Anton Barendregt.

- For Pakistan, addition proposed from Badhra (4 MMboe SS). Reduction of 3.3 MMboe SS in Bilh from production, with potential increase in 2004 based on static/dynamic modeling work by ENI.

- For Deepwater Borneo, proved reserves addition expected for Maharaja Lela (3.3 MMboe SS).

Other actions arising from the meeting are highlighted in the individual OU sessions above.

A summary of the outcome/follow-up to the challenge session is given in Attachment 7.

The LE for proved reserves addition was updated following the meeting, as shown in Attachment 8. This shows a PRR LE of 59%, with 65% including upsides. The LE still reflects the proposed reserves downwrite in Thailand, which will be subject to review in the second week of December.

As well as allowing challenge of the major proved reserves additions proposed for EPA, it was clear that the session had great benefit in bringing individual OU staff together and in providing valuable insights to the OU reserves bases. The OU staff are complimented on the preparations made for the session, as are EPA management for their clear commitment to hydrocarbon resource maturation.

Timing of the meeting was considered suitable, albeit at the late end of the review window, as allows actions to be completed for ARPR preparation. Future meetings will be held around late Q3.

John Sutherland
EPA Reserves Coordinator