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2 UNITED STATES DISTRICT COURT

3 FOR THE DISTRICT OF NEW JERSEY

4 CIVIL ACTION NO. 04-374 (JWB)

5 IN RE:

6 ROYAL DUTCH/SHELL :

7 TRANSPORT SECURITIES :

8 LITIGATION :

9 -----

10 Videotaped Deposition of IAIN PERCIVAL

11 Washington, D.C.

12 Friday, February 9, 2007

13 10:09 a.m.

14 Job No.: 22-94168

15 Pages: 1 - 184

16 Reported By: Dawn M. Hart, Notary Public, RPR/RMR

17 Videographer: Richard Fazio

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4 Videotaped deposition of Iain Percival, held at

5 the law offices of:

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13 Pursuant to Notice, before Dawn M. Hart,

14 RPR/RMR.

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1 A P P E A R A N C E S

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25 ALSO PRESENT: Christine Martinez

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1 C O N T E N T S

2 EXAMINATION OF IAIN PERCIVAL PAGE

3 By Mr. Bigin 9

4 By Mr. Clark 178

5 E X H I B I T S

6 (Attached to the transcript.)

7 PERCIVAL DEPOSITION EXHIBITS PAGE

8 1 E-mail 10/28/99 plus attachment 28

| | | | |
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| 9 | 2 | E-mail 3/30/01 plus attachment | 60 |
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| 11 | | Generation 2/8/02 | 85 |
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| 13 | 5 | E-mail 3/24/00 plus attachment | 120 |
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1 P R O C E E D I N G S

2 VIDEOGRAPHER: Here begins Videotape No. 1

3 in the deposition of Iain Percival In Re Royal
4 Dutch/Shell Transport Securities Litigation in the
5 United States District Court for the District of New
6 Jersey, Civil Action No. 04-374. Today's date is
7 February 9th, 2007. The time on the video monitor
8 is 10:09 a.m.

9 The video operator today is Richard Fazio.
10 This video deposition is taking place at LeBoeuf Lamb
11 located at 1875 Connecticut Avenue, Suite 1200 in
12 Northwest Washington, D.C.

13 Counsel, please voice-identify yourselves
14 and state whom you represent.

15 MR. BEGIN: Michael Bigin from Bernstein
16 Liebhard & Lifshitz on behalf of Lead Plaintiffs
17 Peter M. Wood and the Class.

18 MR. LAWRENCE: Michael Lawrence, Bernstein
19 Liebhard & Lifshitz, on behalf of Lead Plaintiff Peter
20 M. Wood and the Class.

21 MR. HABER: Jeffrey Haber, Bernstein
22 Liebhard & Lifshitz on behalf of the Lead Plaintiff,
23 Peter M. Wood, and the Class.

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1 IAIN PERCIVAL

2 MS. AGRO: Jill Agro, Grant & Eisenhofer on
3 behalf of the Opt-Out Plaintiffs.

4 MS. WICKHEM: Rebecca Wickhem, Foley &
5 Lardner, LLP on behalf of Judith Boynton.

6 MR. JENSEN: Adrian Jensen, Foley & Lardner,
7 LLP on behalf of Judith Boynton.

8 MS. MARSHALL: Gabrielle Marshall, Hughes
9 Hubbard & Reed on behalf of PricewaterhouseCoopers.

10 MS. TISKA: Tracy Tiska from Hogan & Hartson
11 for Defendants KPMG Accounts NV.

12 MS. LIEBERMAN: Sharan Lieberman from Mayer
13 Brown Rowe & Maw on behalf of Sir Philip Watts.

14 MR. JAMES: Derek James, LeBoeuf Lamb Greene
15 & MacRae on behalf of the Shell Corporate Defendants
16 and the witness.

17 MR. CLARK: Christopher J. Clark, LeBoeuf

18 Lamb Greene & MacRae on behalf of the Shell Corporate

19 Defendants and the witness, Mr. Percival.

20 MR. PLATT: Charles Platt, Shell

21 International B.V. on behalf of the Shell Corporate

22 Defendants.

23 VIDEOGRAPHER: The Court Reporter today is

24 Dawn Hart of LAD Reporting Company. The Washington

25 D.C. Notary is Anthony Delaglio who will now

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1 IAIN PERCIVAL

2 administer the oath.

3 IAIN PERCIVAL

4 having been duly sworn, testified as follows:

5 EXAMINATION BY COUNSEL FOR LEAD PLAINTIFF

6 PETER M. WOOD AND THE CLASS

7 BY MR. BIGIN:

8 Q Before we begin, I'd just like to instruct

9 the witness that though this deposition is being

10 videotaped, please respond to the questions orally so

11 that the stenographer can create an accurate

12 transcript.

13 Also for this deposition, unless I specify

14 otherwise, my questions relate to the time period

15 between April 8th, 1999 and March 18th, 2004. If

16 you'd like to take a minute to write this period down

17 for your reference throughout, please feel free to do

18 so.

19 Additionally I expect that we'll take hourly

20 breaks, but if at any time you require a break, just

21 let me or your counsel know and we'll accommodate you.

22 And finally, as a definition, throughout the

23 deposition today I may use the term Shell. And when I

24 use that term, I'll be using it broadly to refer to

25 Royal Dutch Petroleum, Shell Transport and Trading, as

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1 IAIN PERCIVAL

2 well as any operating companies and service companies

3 in which they have an interest.

4 Are you ready to begin?

5 A Yep.

6 Q Okay. Can you please state your name for
7 the record?

8 A Iain Dunn Ross Percival.

9 Q And where do you currently reside?

10 A In the Hague in the Netherlands.

11 Q And for how long have you lived there?

12 A Since end '98.

13 Q And are you currently employed?

14 A I am self-employed.

15 Q And for how long have you been
16 self-employed?

17 A Since retirement from Group Service, from
18 Shell Group Service, 1st of February 2006.

19 Q And what kind of work do you do?

20 A I enjoy my retirement, but I also do
21 occasional consulting and teaching work.

22 Q Do you consult for Shell?

23 A No.

24 Q So what was your last position again at
25 Shell before you retired?

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1 IAIN PERCIVAL

2 A The Group Chief Petroleum Engineer.

3 Q And what did that position entail?

4 A The job entailed being responsible for the,

5 the capability and competence of the entire global

6 petroleum engineering and production geoscience staff,

7 to advise on matters regarding field development

8 planning, and to look after the ongoing work, which is

9 the production of a number of global processes

10 regarding the work in the subsurface. The work was

11 still ongoing when I retired.

12 Q Who did you report to in that position?

13 A I reported to -- gosh, amazing how the

14 memory goes after a couple of years.

15 If you'd like, the head of EP Technology was

16 John Darley, but there was someone in between -- Paul

17 Mann, yeah, who was the head of a group called

18 Technical Operational Excellence.

19 Q And for how long were you at that position?

20 A I took that job in July of 2004. Let me

21 check on that. Four, '5, '6 -- yeah, 2004.

22 Q Okay.

23 A No, can I correct that? I'd say 2003, 2003.

24 Q July 2003?

25 A July 2003, yeah.

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1 IAIN PERCIVAL

2 Q Okay. Yeah, if at any point you want to

3 make a correction to something that you testified

4 about, feel free to do so.

5 A Yeah.

6 Q So in 1999 were you also employed by Shell?

7 A I was.

8 Q And what was your position at that time?

9 A In 1999, I was part of the then SEPTAR

10 organization, and I was VP of something called Shared

11 Earth Model, referred to very often as SEM.

12 Q And do you recall when you started at that

13 position?

14 A Yeah. It was -- I think I went on payroll

15 in Rijswijk in The Hague towards the end of November

16 '98.

17 Q And for how long were you a VP of SEM?

18 A Until July of '99 when there was an

19 alignment between the two technical organizations in

20 States and the Netherlands.

21 Q Did someone succeed you in that position?

22 A Yeah.

23 Q Do you recall who that was?

24 A That was then Fred Hoffman.

25 Q Okay. When you were at SEM, were you based

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1 IAIN PERCIVAL

2 in Rijswijk?

3 A Yes.

4 Q Was there an SEM division in Houston at that

5 time?

6 A An equivalent, I believe. And it may even

7 be that the SEM terminology -- again, my memory is
8 slightly hazy here -- actually came about when the
9 alignment of the two technology organizations happened
10 in July of 1999. And in fact looking back, I think I
11 actually was VP of Technology Development and
12 something else, but it was to do very much with
13 subsurface, subsurface technology.

14 Q And what kind of -- or what did you do --
15 can you explain that to me -- strike that.

16 Can you explain what you mean by had to do
17 with subsurface technology?

18 A Yeah, sure. The, the entity I joined when I
19 came in was then called RTS, which was Research and
20 Technical Services, and my job was to lead the group
21 which developed essentially software to enable
22 petroleum engineers and geoscientists to do what
23 petroleum engineers and geoscientists do. Shell is
24 very much someone who develops their own software.
25 And part of my job was also leading the overall

1 IAIN PERCIVAL

2 technology strategy and planning process.

3 Q Was that software used for reservoir

4 modeling?

5 A Part of the portfolio indeed was what we

6 like to call static and dynamic reservoir modeling,

7 yeah.

8 Q Was it also used for reserves estimation?

9 And I'm using the term reserve generally.

10 MR. CLARK: Objection. Vagueness.

11 A The software is used to describe, if you

12 like, the static situation subsurface, i.e., what the

13 geology looks like. And then it's, it's -- the term

14 used is coupled or joined up to how fluids move

15 through the reservoir. The software itself is not,

16 say used in terms of button-pushing to produce

17 volumetric estimates. It's the output from that

18 software which is then used by geoscientists and

19 engineers to do calculations which eventually end up

20 as oil in place, gas in place, or indeed reserve

21 estimates in the various categories of reserves. But

22 the software itself does not generate the actual
23 estimates.

24 Q Are you familiar with the term called, I
25 believe it's an acronym, STOIIP?

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1 IAIN PERCIVAL

2 A I am indeed, yep.

3 Q Can you explain what that is?

4 A That's stock tank oil initially in place.

5 Q And is that an equivalent, if you will, to
6 the static view?

7 A That indeed is the oil that's there and not
8 moving. It's the static volume, yeah.

9 Q At what point in 1999 did your position
10 change?

11 A The alignment, the official alignment date
12 was the 1st of July 1999. That's when the new
13 organization which was then called STEP, Shell
14 Technology EP, became live.

15 Q I see. And one other question. ~~Page 16~~

16 this change, who did you report to in the SEM role?

17 A To Tim Warren.

18 Q And now in July 1999 when it became STEP --

19 STEP AG; is that correct?

20 A No, it was just STEP.

21 Q Just STEP.

22 A AG? No.

23 Q No. Was it part of SEPTAR at that point?

24 A No. SEPTAR was in fact part of STEP. If

25 you like, the hierarchy was STEP at the top, and

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1 IAIN PERCIVAL

2 SEPTAR was a very large part of STEP.

3 Q And what were your responsibilities in that
4 role?

5 A When I -- as of 1st of July?

6 Q Uh-huh.

7 A Then I became the global leader of an entity

8 that was called GIS, which was essentially Geoscience

9 Integrated Services, and there the, in global terms
10 the job was looking after basin analysis and field
11 development.

12 In addition to that, which I'm quite sure
13 you've seen, there was -- part of my job was looking
14 after specialists, rock and fluid analysis, looking
15 after geomatics, which is a smart word for basically
16 surveying and the handling of spatial data, and --
17 yeah, I think that was it.

18 Q And were you based in Rijswijk when you were
19 at that position?

20 A Yes. For the entirety of my time from the
21 end of '98 to retirement I was based in Rijswijk.

22 Q While you were based in Rijswijk -- we can
23 flip back to the earlier period for SEM Group -- did
24 you manage people from Houston at that period of time?

25 A No. During my -- prior to the 1st of

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1 IAIN PERCIVAL

2 July 1999 I had no, no staff responsibility whatsoever

3 for Houston, yeah.

4 Q After July 1999 did that change?

5 A Yes. I then inherited a group of staff who

6 were based in Bellaire, in the Bellaire Technology

7 Center, known as BTC. So my group was roughly

8 65 percent in Rijswijk and 35 percent in Houston,

9 roughly.

10 Q Okay. And who did you report to in that

11 position.

12 A I'm -- as part of the alignment of the two

13 entities, a new -- I got a new boss called Paul

14 Sullivan.

15 Q Was Paul Sullivan the head of SEPTAR?

16 A He was the head of SEPTAR, yeah, the

17 Director of SEPTAR, yeah.

18 Q So GIS was part of SEPTAR --

19 A Correct.

20 Q -- is that correct?

21 A Correct.

22 Q And how long did you hold that position?

23 A I got to make sure I got my dates right

24 again. Until July of 2003. And let me just count --

25 '4, '5 -- yeah, 2003.

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1 IAIN PERCIVAL

2 Q And what was your new position in July 2003?

3 A I then became -- it was a rather strange

4 title, a very long one called the Global Leader of

5 Hydrocarbon Maturation, which without any change in

6 job, then after a matter of time to make it easier to

7 understand for everybody, especially the outside

8 world, became the Group Chief Petroleum Engineer which

9 was something that everybody could recognize --

10 Q I see.

11 A -- internally and externally.

12 Q Was this a newly created position?

13 A Relatively new. The actual position had

14 been created a little bit earlier as part of a move to

15 technical and operational excellence in the EP part of

16 the Shell group.

17 Q Did someone hold this position before you

18 took it?

19 A Yes.

20 Q Do you recall that individual?

21 A Yeah. That was a gentleman called Jim

22 Chapman.

23 Q Did Jim Chapman train you for some way for

24 this -- to take over this position?

25 A Well, what do you mean by train?

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1 IAIN PERCIVAL

2 Q Was there any formal training?

3 A No. There was -- there was essentially a

4 handover. It was interesting that Jim had worked for

5 me in Brunei. So it was an interesting relationship

6 and handover, yeah.

7 Q I see. And you were at that position until

8 your retirement?

9 A Yeah.

10 Q Do you know -- strike that.

11 Was there a reason why you were put in that
12 position?

13 MR. CLARK: Objection. Calls for
14 speculation.

15 Q If you know.

16 A I moved from one position to another. The
17 job that I had been doing essentially was reorganized
18 away and I was invited by John Darley to take this new
19 position because Jim Chapman had actually had a heart
20 attack.

21 Q I see. Did you -- you didn't request this
22 position; is that correct?

23 A I didn't put my hand up and say, I really
24 want this job, but when John asked me, I said, that's
25 a pretty cool job, so yes, I'd like to do that, yeah.

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1 IAIN PERCIVAL

2 Q And how were you qualified for that job?

3 A Well, I'd spent -- you know what I've done,

4 I've spent my entire Shell career working on various
5 parts of petroleum engineering, both in a technical
6 function and as a leader and managerial function. So
7 if you like, it was a, a normal progression. And in
8 fact the job itself was rather akin to what I'd been
9 doing as the leader of GIS, except it was now a global
10 remit rather than looking after a population within
11 SEPTAR/STEP.

12 Q And was one of the focus of this job to
13 create Field Development Plans for the various OUs?

14 A No, specifically not. The Field Development
15 Plans are created by the OUs. The job I had to do was
16 to develop a, if you like, unified global approach to
17 field development planning and to a number of other
18 activities. So there was, if you like, one size,
19 shape and field to how we did thing in component parts
20 of Shell's global enterprise.

21 Q And what pieces of Shell's enterprise did
22 you use to create this global approach?

23 A Well, when I use the word Shell global
24 enterprise, I meant in fact across all the OUs. So
25 essentially I was looking at developing a process,

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1 IAIN PERCIVAL

2 with colleagues of course, that could be used in any
3 of the OUs so that people were doing the same sort of
4 thing. So that it doesn't quite fit with your
5 question as I understand it.

6 Q Was SEPTAR still in existence when you took
7 this new position?

8 A No. As part of an overall realignment,
9 reorganization is a word not used very much --
10 realignment, SEPTAR itself disappeared. The work
11 essentially stayed the same to a large measure, but
12 what was being done at SEPTAR was then called EPT-R,
13 which is EP Technology, slash, Research, with the
14 focus being indeed very much on the technology
15 development, along the lines of what was done in, say
16 the SEM. And the work that I'd been doing continued
17 as a result indeed off an internal alignment of my old
18 outfit called GIS and Shell Deepwater Solutions. That

19 then became a new entity called EP Solutions.

20 Q Did GIS become EP Solutions; is that what
21 you're saying?

22 A It didn't become as an entirety EP
23 Solutions. It plus SDS became EP Solutions.

24 Q I see.

25 A So SDS also ceased to exist as an entity.

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1 IAIN PERCIVAL

2 Q And what was SDS?

3 A Shell Deepwater Solutions.

4 Q Were you in charge of Shell Deepwater
5 Services while at GIS?

6 A No, it was a completely separate entity.

7 Q I see. And did you assist in realigning
8 Shell Deepwater Services with GIS?

9 A Yes. I was part of a three-man group, plus
10 of course a number of helpers who actually, if you
11 like, designed and worked the transformation or the
12 alignment of two quite large entities into an even

13 larger entity called, indeed, EP Solutions.

14 Q Do you recall why it was decided that GIS

15 and SDS should merge?

16 A Yes. After a couple of years, there was a

17 workshop on, is STEP still -- is it efficient, is it

18 fulfilling the role that had been asked of it to

19 deliver in July of 1999? And the conclusion was drawn

20 that there was a degree of, say, overlap. And to me

21 it seemed most efficient and effective use of the

22 individual resource, it was almost certainly better to

23 have one subsurface group called EP Solutions, and

24 that's indeed what we did.

25 Q What, if you recall, was an efficient use of

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1 IAIN PERCIVAL

2 the resource?

3 A It was essentially looking at, so if you've

4 got X reservoir engineers in GIS and X reservoir

5 engineers in SDS, meaning 2X, possibly this same

6 amount of work could be done by, if you like, 1.6X.

7 So it was essentially looking at how we could make

8 best use of the staff in the light of a continuing

9 request, indeed, for staff to work in the Operating

10 Units around the globe. So we wanted to be sure that

11 the best use was being made of the, the sets of

12 reservoir engineers, geologists, et cetera, et cetera.

13 Q Were offices still maintained in Rijswijk,

14 as well as Houston for this new entity?

15 A Rijswijk, Houston, and indeed Aberdeen,

16 which was a sort of subset of Rijswijk. So there was

17 a sort of three-hub structure.

18 Q Was New Orleans part of that as well, or was

19 it just the three-hub structure?

20 A No, New Orleans was not part of EP

21 Solutions, no.

22 Q What kind of work came out of Aberdeen, if

23 you know?

24 A Exactly the same work that was -- came out

25 of The Hague and out of Houston; essentially field

1 IAIN PERCIVAL

2 studies.

3 Q I see. Did these groups work together?

4 A If I could give you my definition of

5 together. They followed similar processes, they

6 followed best practices, but the actual work was very

7 much, if you like, ring-fenced. So that the Aberdeen

8 group would do work for, say couple of projects in

9 Nigeria. The group in Rijswijk would also be working

10 in Nigeria, but it would be different projects. The

11 group in Houston could be working on, indeed,

12 deepwater activities. A lot of work still for New

13 Orleans for the new entity called EPW, because this

14 was all part of the new Shell EP model. But there was

15 quite an effort made to just to make sure that, yes,

16 practices were shared, but the work was quite clearly,

17 if you like, ring-fenced so there was no confusion and

18 people knew what they were supposed to do and to

19 deliver against it, yeah.

20 Q And -- strike that.

21 Was that a change of practice -- from

22 practices that happened prior in, say in '99 through

23 2002?

24 A Could you help me understand what you mean

25 by practice?

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1 IAIN PERCIVAL

2 Q This use of ring-fence teams?

3 A No, that was a continuation. If I roll back

4 to July of '99 when the new entity was put up, there

5 was a desire to create, if you like, a fluid global

6 organization working in global teams using IT. That

7 was a great dream, but the practicalities became clear

8 after a matter of months that just because of time

9 zone difference, and -- yeah, essentially time zone

10 difference. It made a lot of sense to say, okay, a

11 team in Rijswijk or Aberdeen will do such-and-such

12 work, the team in Houston will do work. And indeed,

13 there were regular get-togethers to share practice,

14 but the actual work, the deliverables, the Terms of

15 Reference were very much owned by a group located in
16 either Houston or Rijswijk or indeed Aberdeen when
17 Aberdeen sent their group.

18 Q When you say shared practices, what do you
19 mean by that?

20 A Well, the whole industry has been working
21 hard to make sure that knowledge-sharing, practice-
22 sharing, what works well in one part of the world
23 works somewhere else. So basically it was what works
24 for you there, what doesn't work, can we learn from
25 each other, this type of stuff.

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1 IAIN PERCIVAL

2 Q Would studies be coordinated between the
3 groups?

4 A No. As I just said, the studies themselves
5 were very much ring-fenced. The sort of discussions
6 that would happen, and indeed say three or four times
7 a year I would organize a video conference or even a

8 face-to-face to say, okay, let's look at the lessons

9 learned by Team A in Houston on Project X and Team Y

10 in Rijswijk on project-whatever. What were the

11 lessons learned? Can we -- can we learn from this?

12 Can we make sure that, say pitfalls aren't fallen into

13 again, that the best practice is replicated and

14 adopted by such-and-such a group. It was just, if you

15 like, a common-sense way of making sure that you had

16 a -- you were developing a learning organization.

17 Q Do you recall attending a Subsurface BAA

18 Workshop in November of 1999?

19 A November 1999. If my memory serves me

20 correctly, that was when I was still in Brunei. I

21 hadn't actually quite joined the new organization.

22 Q Okay. Do you know what a BAA Workshop is?

23 A Yes. BAA stands for, not the British

24 Airport's Authority but indeed -- which confused some

25 people in the travel arrangements, it basically was a

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2 Business Alignment Area. And this indeed was an
3 effort to sharpen up, if you like, the focused
4 application of technologies to, to problems. So
5 making sure that -- so we want to get better at
6 defining or describing carbonate rocks. What sort of
7 technologies do we require? That would be a BAA. And
8 representatives from the, the entire Shell group
9 attended that and basically shared problems, shared
10 technical challenges, and shared the development of
11 solutions.

12 Q Do you recall if you typically attended
13 these workshops during the period we mentioned at the
14 beginning?

15 A Typically -- what?

16 Q Attended these workshops?

17 A I attended some workshops, but not all. The
18 prime reason being that as in the new organization, I
19 wasn't responsible any more for developing technology,
20 and obviously I had the responsibility in implementing
21 technology, so I would have the agenda sent to me, it
22 would be shared and I would say, oh, that sounds

23 interesting, I'll come to that. But I wasn't any more

24 a key player. That was very much Fred Hoffman's job.

25 Q I see. Do you recall presenting at any of

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1 IAIN PERCIVAL

2 these workshops?

3 A I can't remember specifics.

4 Q Okay.

5 A I'm sure I did.

6 MR. BIGIN: Okay. Let's mark our first

7 Exhibit.

8 (Exhibit No. 1 was marked for identification and

9 was attached to the transcript.)

10 (Discussion off the record.)

11 BY MR. BIGIN:

12 Q We're marking as Exhibit No. 1 a document

13 with -- identified by number 0103840952. It's a

14 E-mail and attachment dated 10/28/1999. I'll ask the

15 witness just to take a couple of minutes to review the

16 Exhibit.

17 A (Reviewing).

18 Yep, I recognize it.

19 Q You say you recognize this document?

20 A Yes. Yes.

21 Q Does this refresh your recollection whether

22 or not you attended this November '99 BAA Workshop?

23 A Yep.

24 Q Do you recall presenting at this workshop?

25 A I can't recall the specifics, but there's a

0029

1 IAIN PERCIVAL

2 slide that says Iain's Presentation, so -- or A Talk

3 From Iain, so presumably I said something there.

4 Q If you -- I apologize, the pages aren't

5 numbered. But if you flip to the fifth page of the

6 Exhibit --

7 A (Complying).

8 Q -- it's titled Globalization of EP

9 Technology.

10 A Yep.

11 Q I was wondering if you recall this slide.

12 A I do.

13 Q Do you recall whether or not you presented

14 this slide as part of your talk?

15 A I can't remember.

16 Q Okay. The second-to-last bullet point

17 states that since 19 -- July 1st, 1999 one global

18 technology provider.

19 A Yes.

20 Q Can you tell me what that means?

21 A Well, if you look at the previous bullet

22 point, two overlapping but distinct R&D programs, we

23 obviously had developed this singular entity which

24 would work indeed on technology development but

25 serving indeed the global customer base. So we said

0030

1 IAIN PERCIVAL

2 that, right, with STEP, subset SEPTAR, would now

3 indeed be providing technology from the singular

4 entity to the Shell group, but of course from -- at

5 this point in time to two locations, one being

6 Rijswijk, one being Houston. This was pre-Aberdeen.

7 Q And what does one global customer base mean?

8 A It means all the Shell OUs.

9 Q Okay.

10 A I guess OU meaning Operating Unit, yeah.

11 Q And if you flip to the next page.

12 A Yes.

13 Q Titled STEP: One Global Technology

14 Organization. Do you recall this slide?

15 A Yes.

16 Q Okay. At the middle of the slide there's a

17 big circle that says Co-operation Agreement.

18 A (Nods head).

19 Q Do you know what that means?

20 A I know what it means, I don't know the

21 details. But essentially it was a, a cover -- and if

22 I may look to my, my right, it's a cover for a legal

23 construct, I believe, which, if you said, governed the

24 activities of the two locations.

25 Q Do you recall that there was an ~~address~~ ~~30813~~

0031

1 IAIN PERCIVAL

2 contract of some sort regarding this?

3 A I can't -- I can't recall.

4 Q And so generally what does this -- what does
5 this slide mean? I see we have USA on one side, The
6 Netherlands on the other side. Can you just explain
7 it to me in general terms?

8 A Well, as you see you've got a B.V. on the
9 right-hand side which I think stands for Benot Vof
10 (phonetic), or some -- it's a Dutch legal term
11 describing a -- the company, the company legal entity.
12 Then you have an Inc. on the other side for the U.S.
13 side. And for, for, I believe legal reasons, the Inc.
14 continued, B.V. continued, and so there had to be some
15 overall umbrella which covered the activities.

16 I must say that myself and my colleagues as
17 technologists, technology providers, we got on with
18 the work, and those above us, plus the legal advisors

19 made sure that everything was properly constructed in
20 terms of the legal side.

21 Q Did the customers, or OUs have to approve
22 this agreement?

23 A No.

24 Q Were the OUs given that agreement?

25 A I don't know.

0032

1 IAIN PERCIVAL

2 Q And on the next page there's a title, What
3 Does This Mean For Us? And the first bullet is two
4 sites, one management. Is that referring to the
5 Rijswijk and Houston site?

6 A Yes.

7 Q And who would be the one management?

8 A Well, if I look at SEPTAR, there was one
9 management team, Paul Sullivan, I mentioned earlier,
10 as indeed the Director of SEPTAR; myself, Fred Hoffman
11 and several others who looked after staff and led --

12 managed staff located on both sides of the Atlantic.

13 Q And did the one management -- strike that.

14 Do you know where Mr. Sullivan's offices

15 were?

16 A Mr. Sullivan was based in Rijswijk.

17 Q Did Mr. Sullivan also have offices in

18 Houston?

19 A Yeah, he had a room in Houston.

20 Q Did you also have offices in Houston?

21 A No, I did not.

22 Q Were you required to travel to Houston?

23 A Well, the word required is an interesting

24 one. In the beginning I wished to travel to Houston

25 regularly, and I did; as Fred did to Rijswijk. We

0033

1 IAIN PERCIVAL

2 wished to demonstrate to the staff that they indeed

3 had a manager, a leader. It didn't matter which site

4 you were on, but you had indeed this one manager. So

5 it was very important that your face was seen

6 regularly on both sides. But I didn't maintain an
7 office in Houston. In fact, I always had to say make
8 sure there's somewhere for me to plug my computer in
9 when I arrived.

10 Q You mentioned you wished to do that. Did
11 that actually happen?

12 A What, plug my computer in, or travel?

13 Q Apologies. Travel.

14 A Yes. No indeed, it was -- obviously it was
15 up to you how often you wanted to travel. So indeed
16 for the first year both Fred and I were making a large
17 number of trips (indicating), passing each other on
18 the way, yeah.

19 Q So was this between '99 and 2000?

20 A Yeah, the emphasis was on building a
21 community of staff, irrespective of the location. So
22 for the first year, 15, 16 months, there was a lot of
23 travel, which then started to, to reduce as the
24 organization lived and was bedded in.

25 Q Excuse me? What was that?

1 IAIN PERCIVAL

2 A Organization lived and bedded in. So
3 basically started to really live and knew what it had
4 to do. An English expression used, bedding in.

5 Q I see. Thank you.

6 And what was it that it knew it had to do?
7 I guess I'm a little confused. Could you explain that
8 for me?

9 A Well, obviously there was a work plan, as
10 any organization has; clarity on tasks and targets,
11 clarity on objectives, regular performance reviews,
12 the type of thing that one would hope and expect that
13 the leader/manager would be doing with staff.

14 Q Was this a globalizing of the GIS cluster?

15 MR. CLARK: Objection.

16 A Glob -- well, depends what you mean by
17 globalizing.

18 Q Let me ask you different. Is that part of
19 becoming one global technology provider?

20 A Yes.

21 Q What's your understanding of globalizing?

22 A It meant having available to the, the Shell

23 Operating Units the provision of technology, the

24 provision of advice from one unit. And it was not

25 really the intention that the Operating Units

0035

1 IAIN PERCIVAL

2 themselves would decide, we wish to go to Aberdeen or

3 we wish to go to Rijswijk or we wish to go to Houston.

4 They would make a request and then it was up to myself

5 or my colleagues to decide, indeed, where that work

6 was done.

7 I think I said to you earlier on we wanted

8 to make sure that there was no confusion, so work was

9 essentially ring-fenced for Houston, for Rijswijk and

10 then for Aberdeen. Obviously many people knew each

11 other in Shell, and so we wanted to stop people just

12 ringing up and asking someone they knew if something

13 could be done. That would have caused chaos, and

14 that's not what we wanted. 30839

15 Q And that was part of your job at the time,
16 to decide where certain work was done?

17 A Yes.

18 Q And did you come to those decisions based on
19 where certain expertise resided?

20 A Partly. The other part of the equation was
21 that the -- historically the BTC had worked
22 exclusively almost for New Orleans. New Orleans, the
23 Shell operation there, the Shell Company called SEPCO,
24 relied heavily on their colleagues one-hour flight
25 away in Houston, and we made sure that continued.

0036

1 IAIN PERCIVAL

2 So the focus, or the locus of the work
3 certainly in the first year of the guys and girls in
4 Houston was indeed continuing that very important
5 support to the ongoing operation in New -- based in
6 New Orleans.

7 Q Did the BTC have a certain expertise that

8 the Rijswijk folks did not have?

9 A Yes.

10 Q And can you tell me what that was?

11 A That was essentially Enhanced Oil Recovery
12 expertise.

13 Q And what did that entail?

14 A The -- Shell Oil, as had been before it
15 became part of Royal Dutch, had an extensive
16 experience in various types of EOR developments in
17 California, in Michigan, in Texas; expertise which had
18 not grown in the rest of the group.

19 Q And was that expertise applied outside of
20 the New Orleans group?

21 A Yes. The -- as I said, initially we wished
22 to maintain the continuity of service and work for New
23 Orleans whilst they took steps to readjust their own
24 organization to make sure they became somewhat more
25 self-sufficient, although they still relied heavily on

1 IAIN PERCIVAL 30841

2 advice and work from Houston. But it became clear to
3 us that this EOR expertise, which was aging because a
4 lot of the people were senior, had been in service
5 quite some time, could be used, in particular in Oman.

6 Q I see. Did Houston have expertise water
7 injection?

8 A That is one of the, one of the improved or
9 enhanced techniques that they had. But that was not
10 one of the key expertises. That -- water injection
11 was an expertise which was flourishing in the rest of
12 the group. So it was a particular expertise that we
13 did not feel we had to pull on exclusively from
14 colleagues in Houston.

15 Q I see. Do you know whether or not that
16 practice, if you will, water injection, was developed
17 in Houston?

18 A The water injection grew in parallel in
19 Houston for stateside operations, and indeed in the
20 rest of the Shell group. So indeed, as I said, it
21 grew up since essentially the, yeah, the '70s. So
22 it's a well-established technique.

23 Q I see. Do you know whether or not there was
24 collaboration between Houston and Rijswijk for that
25 particular method of recovery?

0038

1 IAIN PERCIVAL

2 A The Shell groups has for many, many, many
3 years run annual or biannual conferences where
4 petroleum engineers, geoscientists, even lawyers get
5 together and talk about, talk about practices and talk
6 about things. And in terms of technology development,
7 indeed papers would be given just like a small subset
8 of the SPE or APG on what is happening in Texas,
9 what's happening in Oman, what's happening in the
10 North Sea, and indeed at those conferences people
11 would talk, practice was shared, and so expertise,
12 especially in water flooding, happened as a result of
13 these regular conferences. And indeed there were also
14 exchanges organized from scientists working in the old
15 Royal Dutch laboratory in Rijswijk and the Bellaire

16 Technology Center. So there would be specific one- or

17 two-year cross-postings.

18 Q Do you recall a term known as, I believe

19 K To K; do you recall that at all?

20 A K To K?

21 Q Yes.

22 A Does not ring a bell, I'm sorry.

23 Q No? Or Knowledge To Knowledge?

24 A Oh, knowledge sharing.

25 Q Is that what that is. I've seen it in

0039

1 IAIN PERCIVAL

2 documents and I'm curious if you know.

3 A I -- the expression doesn't actually ring a

4 bell with me. Knowledge sharing does. K To K does

5 not.

6 Q There was not, to your knowledge, not a

7 group that was in charge of knowledge sharing; is that

8 correct?

9 A There was a group within Shell, but not

10 working for myself or for Fred, which was working,
11 indeed, on knowledge sharing as a way of improving the
12 business. But this was not just on the technical
13 side, this was covering all sorts of developments and
14 knowledge sharing, as industry, many, many industries
15 were busy developing similar techniques and
16 technologies at the same time.

17 Q Do you recall whether or not this group was
18 within SEPTAR?

19 A I can't recall. It was within STEP, but I
20 don't think within SEPTAR.

21 Q Do you recall whether or not it was called
22 generally leadership teams?

23 A Sorry, could you repeat the question?

24 Q Do you recall whether it was called a
25 leadership team?

0040

1 IAIN PERCIVAL

2 A Well, there were -- we had a leadership

3 team. There were leadership teams, but there was not

4 to my knowledge a leadership team specifically leading

5 knowledge sharing.

6 Q I see. What were your leadership teams back

7 in 1999 we'll say, if you recall?

8 A Yeah. The members, the actual members of

9 the leadership team, do you mean?

10 Q Yes, please.

11 A Yeah. My leadership team at the kickoff of

12 the organization was Lyle Henderson in Houston, Piete

13 Ruijtenburg, Richard Waterland in Rijswijk, Jerry

14 Larthe de Langladure in Rijswijk, Alan Kornacki based

15 in Houston, and Adam Lomas based in Rijswijk.

16 Q And what were their responsibilities?

17 A To lead, to manage, to appraise, to

18 evaluate, to keep an eye on the work of the various

19 groups of staff working for them.

20 Q What would appraise entail?

21 A Staff appraisal, performance appraisal.

22 Q And performance appraisal, does that relate

23 to appraisal of, of reserves?

24 A It relates to the appraisal of your

25 performance and whatever you've been asked to do,

0041

1 IAIN PERCIVAL

2 whether it was developing technology, applying

3 technology, building teams. Just the normal

4 performance appraisal, which staff in any organization

5 go through.

6 Q Do you recall whether or not performance was

7 measured by proved reserves?

8 A No, that could not be because the issue of

9 reserves, the booking of reserves, the estimation of

10 reserves is one hundred percent responsibility of the

11 Operating Units and not responsibility for -- of a

12 technical service provider.

13 MR. CLARK: Do you want to take a break

14 around 11:00, Mike, at a convenient point for you?

15 MR. BEGIN: Okay, let me just look through.

16 Q Let's flip to Page 12 of this Exhibit.

17 A 12.

18 Q Yeah.

19 MR. CLARK: Want to give us the caption on
20 the top?

21 MR. BEGIN: Geosciences and Integrated
22 Services.

23 MR. CLARK: With Iain on the top?

24 MR. BEGIN: It does have Iain on the top.

25 A Okay, I've got it here, yeah.

0042

1 IAIN PERCIVAL

2 Q And in the boxes there are Lyle Henderson,
3 Alan Kornacki and Jim Thomas.

4 A I apologize. I forgot Jim Thomas when I
5 went through my leadership team, yeah.

6 Q Okay. So these, these three individuals
7 were also part of your leadership team? And I believe
8 you named a couple others. Are they also on this
9 sheet?

10 A The other guys I mentioned are on the sheet
11 and in fact there's no -- this was a flat

12 organization. So all of these gentleman should be on
13 one line. It just was the way it was to fit on the
14 page.

15 Q I see. But they all reported to you?

16 A All these, yeah -- was it seven, yeah --
17 reported to me.

18 Q Okay. Let's flip two pages, Page 14, so --

19 A Two pages on?

20 Q Yes, please.

21 And the slide begins SEM & GIS on the top.

22 A Yes.

23 Q With two overlapping circles. And I was
24 wondering if you could explain, number one, if you
25 recognize this slide?

0043

1 IAIN PERCIVAL

2 A I do.

3 Q And if you could explain this slide to me.

4 A Yes. I think if I just step back, at the

5 birth, if you like, of the new aligned organization of

6 STEP/SEPTAR on the 1st of July, it -- in total

7 numbers, I can't remember the numbers, it was rather a

8 large organization. And one thing that myself and

9 Fred Hoffman wanted to demonstrate to the staff was

10 that irrespective of whether you were working in SEM

11 or in GIS, or in Houston or in Rijswijk, in terms of

12 the community, the growing of skills and capability,

13 it was one community of petroleum engineers and

14 geoscientists. So that -- that's why we used -- we

15 talked, especially in the first year, of SEM and GIS

16 together.

17 The other issue was that as any software

18 developer in any industry, the issue they have is so

19 how do we, how do we test the software? How do we,

20 how do we get into the beta testing stage, which is a

21 common industry expression in terms of testing

22 software, how is it done? So one of the things that

23 myself and Fred did was I said, well, we will in GIS

24 and make sure that we are a lead implementer, so we

25 will test the software at the beta stage on projects.

0044

1 IAIN PERCIVAL

2 A, it was a vehicle for testing, and B, it was a
3 demonstration that we were working together.

4 Q After the beta test, where was the
5 technology to be used?

6 A Once the software was proved, then of course
7 it was deployed to any part of the Shell Operating
8 Units.

9 Q In the middle where the circles overlap
10 there is a development/joint development. Do you know
11 what that means?

12 MR. CLARK: Objection. It says deployment/
13 joint development.

14 Q Apologies. Deployment/Dev.

15 A Yeah, if we were to take a look at this
16 picture and go to the left-hand side, if you were to
17 look at this in terms of a time scale, then that's
18 when people are thinking about what sort of software
19 could be developed. And then if you were to take

20 yourself to the right-hand side, that's indicated here

21 the software is actually being used to do things.

22 So in the middle, then you have the beta

23 testing, and as part of the beta testing, of course,

24 things may often go wrong, even Bill Gates sees this,

25 and so there's a feedback loop. So then the people

0045

1 IAIN PERCIVAL

2 testing say, you know, this loop okay, but for these

3 features, but for this, so you'd better make sure that

4 A, B, C, D and E is corrected. And so there's, thanks

5 very much for the feedback, and then it was done.

6 Q Was live data used during this beta testing

7 period?

8 A Live?

9 Q Live data.

10 A Oh, field data, yes.

11 Q Field data. Do you recall specific

12 instances where field data was used for these beta

13 tests?

14 A I just cannot recall the actual individual

15 fields, no.

16 MR. BIGIN: Okay. Let's take our first

17 break. Is that all right?

18 MR. CLARK: Thanks.

19 VIDEOGRAPHER: We're going off the record.

20 The time is 11:01 a.m.

21 (Break taken.)

22 VIDEOGRAPHER: We're back on the record.

23 The time is 11:22 a.m.

24 BY MR. BIGIN:

25 Q Okay. Just going back to our last Exhibit.

0046

1 IAIN PERCIVAL

2 If you could flip to the page with the two circles if

3 you're not already there.

4 A Yes.

5 Q Was there a point when you -- when GIS

6 implemented the technology that was developed

7 according to this chart? 30853

8 MR. CLARK: Objection. I don't understand
9 the question.

10 Q Do you understand the question?

11 A No.

12 Q Okay. Is there -- is there technology that
13 GIS implemented for OUs?

14 A You said for own use.

15 Q For OUs.

16 A For OUs.

17 Sometimes as part of the service agreement
18 or the deployment agreement or whatever the expression
19 was with the OU they would say we would like you to
20 use whatever technology, and often, actually, it was
21 existing technology, maybe even one provided by
22 someone like Schlumberger, a third party. So they
23 would very often specify what they wanted.

24 Q Did GIS install certain programs for OUs?

25 A No.

1 IAIN PERCIVAL

2 Q Did GIS travel to OU sites to train OU

3 personnel how to use technology?

4 A Sometimes, yes. Again, part of the

5 agreement often.

6 Q Do you recall any particular instances where

7 that happened?

8 A Nigeria, specifically SPDC, which stands for

9 Shell Petroleum Development Company, in Nigeria, a

10 large number of studies done out of Rijswijk for SPDC

11 involved an element of training, and that would often

12 also involve the additional coaching in a particular

13 software.

14 Q Do you recall when that occurred?

15 A Specifics, I can't.

16 Q Do you recall who was involved in that?

17 A Again, individuals, I can't.

18 Q Do you know whether or not the technology

19 used by GIS was employed by the OUs in their

20 estimation of reserves?

21 A As I said previously, the technology, static

22 and dynamic modeling, is -- provides information which

23 is then used by the individual petroleum engineer and

24 geologist to actually make estimations of in-place or

25 recoverable volumes, yeah.

0048

1 IAIN PERCIVAL

2 Q Was there also technology that was used for
3 enhancing production?

4 A There is technology, but not part of the GIS
5 or SEM portfolio.

6 Q I see. Do you know what portfolio it's a
7 part of?

8 A It's commercially-available technology.
9 It's normally Asset or whatever, but you buy it from a
10 third party.

11 Q Would GIS broker these arrangements with
12 third parties to the extent they existed?

13 A No, that was not part of the GIS remit.

14 Q Was that part of the SEM agreement (sic)?

15 MR. CLARK: Objection.

16 Q You can answer. If you know.

17 A Well, let me clarify, or let me understand
18 the question. You mentioned the word production.

19 Q Correct.

20 A Yeah. And production, or enhancing
21 production was not part of either SEM or GIS. That
22 was the remit of other parts of SEPTAR.

23 Q I see. And do you recall what other parts?

24 A The wells domain. I forget the actual name,
25 but it was in the domain of the wells entity.

0049

1 IAIN PERCIVAL

2 Q I see. And do you recall where the wells
3 entity was located physically?

4 A Rijswijk.

5 Q Were there offices in Houston as well?

6 A Yes.

7 Q Do you recall any projects that they worked
8 on in particular?

9 A Again, not -- not specifics. I was not part

10 of that organization, and so they did their thing and

11 we did our thing.

12 Q Did they report to you?

13 A No.

14 Q I'll just ask if you're aware of any regions

15 that they worked on?

16 A Globally, yeah.

17 Q Any global regions? Within the globe. For

18 instance, particular OUs.

19 MR. CLARK: Objection. Asked and answer.

20 Q I believe I asked about the fields before,

21 and now I'm asking about the OUs. Are you aware of

22 the OUs -- any OUs that they worked on?

23 A I know they worked on -- worked for all OUs

24 to a greater or lesser extent. Again, the details I

25 don't know as it was not part of my organization.

0050

1 IAIN PERCIVAL

2 Q Okay. Can you describe what a Field

3 Development Plan is?

4 A I can. It depends how long we have.

5 Q Okay.

6 A A Field Development Plan is essentially a

7 capturing of what does the subsurface look like in

8 terms of its shape and size, how much volume is there.

9 And a Field Development Plan is based on an

10 expectation volume, which itself is based on an

11 in-place volume. And then there will be a number of

12 options on how you may wish to actually exploit that

13 volume.

14 Q And was that something that GIS did?

15 A In terms of writing Field Development Plans?

16 Q Uh-huh.

17 A Yes, they did that.

18 Q Did they have input on the options to

19 exploit the volumes?

20 MR. CLARK: Objection.

21 A Could you repeat the question?

22 Q Did GIS have input on the options available

23 to exploit the volumes?

24 A They did. 30859

25 Q And do you recall if that was done in areas

0051

1 IAIN PERCIVAL

2 like Oman?

3 A Yes, it was done in Oman.

4 Q Was it done by GIS in Oman?

5 A Yes, it was.

6 Q Did GIS recommend options to exploit the

7 volumes in Oman?

8 A GIS came up with ideas to develop the

9 fields, and as part of that, then options would have

10 been presented.

11 Q Do you recall what those options were?

12 A Again, it would be specific to a particular

13 field or a particular part of a field, so it's -- I

14 can't give a global answer.

15 Q Do you recall any specific fields?

16 A I do know some of the fields. I can't

17 remember all, but some I can recall, yeah.

18 Q Which ones can you recall?

19 A One would be Al Huwaisah.

20 Q And do you recall whether options were

21 provided for Al Huwaisah?

22 A They were provided, yes.

23 Q Do you recall whether GIS developed a Field

24 Development Plan for Al Huwaisah?

25 A Let me clarify the way that GIS worked.

0052

1 IAIN PERCIVAL

2 They would do an amount of technical work on behalf of

3 the, if I can use the word the client, the client in

4 this case, Petroleum Development Oman. The final

5 decision on what to do and how to do it was always

6 that of the Operating Unit.

7 Q And so do you recall whether or not GIS

8 developed a Field Development Plan for Al Huwaisah?

9 A They contributed to a Field Development

10 Plan. Again, let me clarify that as part of the way

11 of working, it was not as if people working in GIS

12 would work on a development plan or a part of a

13 development plan on their own. This was always done

14 with, for example in Oman, Omanis as part of the team

15 as part of the training and development. So there was

16 always OU, Operating Unit, representation in the team.

17 Q And GIS generally contributed to creating

18 Field Development Plans for the various OUs?

19 A Well, you used the word generally, and that

20 is not a word I would use.

21 Q Did GIS contribute to creating Field

22 Development Plans for the various OUs?

23 A Some OUs they did, and many OUs they did

24 not.

25 Q And in Oman what other fields do you recall

0053

1 IAIN PERCIVAL

2 besides Al Huwaisah?

3 A I can remember some, but I can't remember a

4 comprehensive catalog of all the projects that were

5 worked on by GIS.

6 Q Do you recall what offices did work on Al

7 Huwaisah?

8 A That was work done out of Houston.

9 Q Was there also work done out of Rijswijk for

10 that field?

11 A Again, I can't remember the specifics.

12 Q Do you recall the -- if reserves were

13 estimated as a result of that work?

14 A By Petroleum Development Oman, as part of

15 the annual cycle, they would use that work as input.

16 Q Did GIS forward a recommendation to PDO

17 regarding reserves in Oman?

18 MR. CLARK: Objection. Vagueness.

19 A As I say, I can't recall.

20 Q Okay. Do you recall whether or not GIS did

21 work on the Lekhwair field?

22 A Yes, they did.

23 Q And do you recall where that work was done

24 within GIS?

25 A Partly in Houston, and partly by Houston

0054

1 IAIN PERCIVAL

2 people sitting in Muscat, which is in Oman.

3 Q Yes.

4 A Obviously.

5 Q Do you recall the nature of that work?

6 A Again, the specifics I can't.

7 Q Do you recall the Mucanza field?

8 A I think the Muhizner (phonetic) field, was
9 it?

10 Q Oh, same thing. Okay.

11 MR. CLARK: Go with his pronunciation.

12 THE WITNESS: No, there's a field called
13 Musalo (phonetic), and it sounds a bit the same.

14 A So Muhizner, yes.

15 Q Okay. The last field you just mentioned,
16 did Houston do work on that field?

17 A Muhizner?

18 Q Yes.

19 A Yes, they did.

20 Q And Musalo?

21 A No, they did not, but it sounded a little

22 like the same.

23 Q Right. I figured we'd try to cover the

24 both.

25 How about the Yibal field?

0055

1 IAIN PERCIVAL

2 A I can't remember on the Yibal field if they

3 did or did not.

4 Q I see. Can you tell me if there's a

5 difference between the term production and recovery as

6 used at Shell?

7 A There's no global lexicon of terminology

8 which is used by everybody at all times, so

9 unfortunately you have people saying production and

10 recovery, and they can be a little bit intermingled.

11 So I would need to know the context of the

12 conversation if I could remember it.

13 Q I see. Is it your understanding that

14 they're generally the same thing?

15 A I have to give you my view as a subsurface

16 professional. The recovery you get from a field comes

17 up through wells and go through pipes and then becomes

18 production.

19 Q Okay. So the two are at least related?

20 A They are related.

21 Q The field data that GIS interpreted, was

22 that engineering data?

23 A Now I'll need clarification here. The

24 terminology which is used in the United States,

25 engineering is very often used synonymously with

0056

1 IAIN PERCIVAL

2 petroleum engineering. In Europe and UK -- well, the

3 two are together of course -- petroleum engineering is

4 what very often Americans call engineering. So do you

5 mean engineering, or petroleum engineering?

6 Q The U.S. version.

7 A So did they use petroleum engineering data?

8 Q Uh-huh.

9 A Yes.

10 Q Did they interpret that data?

11 A Yes.

12 Q And did they -- and they interpret that for

13 the OUs; is that correct?

14 A Yeah, the data was provided by the OUs. An

15 interpretation was made on behalf of the OU, and then

16 the interpretation returned to the OU for the decision

17 to be made by the OU if it was acceptable or not.

18 Q I see. I believe that, at least in 1999 and

19 I believe until 2002, there's a group called Reservoir

20 Engineering Global Services. Do you recall that

21 group?

22 A Yes, I do.

23 Q And do you recall what they generally did?

24 A That group was targeted at providing work

25 for the engineers down in New Orleans, in SEPCO, SEP

1 IAIN PERCIVAL

2 Company down in New Orleans. Grand title, global, but
3 the bulk of the work was continuing what had always
4 been done was providing the service to New Orleans.

5 Q And that work remained the same up until
6 2003?

7 A No. As capability was built in New Orleans,
8 people transferred from Houston to New Orleans, they
9 took on more and more of that work themselves and much
10 less of -- the work essentially, more or less,
11 withered on the vine in my outfit; i.e., less and less
12 and less of it was done. I said withered on the vine.
13 Yeah.

14 Q And in your outfit were you referring to GIS
15 as a whole, or this group that I just mentioned?

16 A No. That was that specific group which
17 existed in BTC and had to live on for about a year,
18 year and a half at least whilst capability was built
19 in New Orleans.

20 Q Did it also exist in Rijswijk?

21 A The entity did not. Advice was given on

22 occasions by various individuals in various parts of

23 SEPTAR.

24 Q Were there persons that reported to

25 Mr. Henderson -- I believe is the head of that group?

0058

1 IAIN PERCIVAL

2 A Yeah.

3 Q -- who were stationed in Rijswijk, as well

4 as Houston?

5 A No. Lyle had only purview over people in

6 Houston.

7 Q And who had the responsibility for the

8 Rijswijk personnel?

9 A The expertise, some was in GIS and some was

10 in SEM.

11 Q Was there a division along the lines of

12 expertise?

13 A A di -- what sort of division are you

14 referring to?

15 Q For having personnel in Rijswijk versus

16 Houston.

17 A No.

18 Q There's also a group called, I believe Rock

19 and Fluid Services. Do you recall that group?

20 A Yes, I do.

21 Q And did that group also report to you?

22 A That group did, yes.

23 Q And can you just tell me generally what that

24 group, what the purpose was?

25 A To analyze the properties, the physical

0059

1 IAIN PERCIVAL

2 properties of rocks and fluids through laboratory

3 techniques.

4 Q And do you recall whether that group had

5 offices in Houston as well as Rijswijk?

6 A They -- at both locations, yes.

7 Q And do you recall specific projects that

8 that group worked on?

9 A There were quite a number of projects.

10 Q Do you recall projects which the Houston

11 group worked on for that group?

12 A Some I can. I can't -- the complete catalog

13 I cannot, yeah.

14 Q Let's start with which ones you can. Can

15 you tell me, please?

16 A The De Lima field.

17 Q Where is that located?

18 A That's located next-door to Lekhwair.

19 Q I see. And that's in Oman?

20 A Yes.

21 Q Do you recall any of the results of their

22 work on that field?

23 A The results, I can't recall.

24 Q Any other fields?

25 A No, I can't be specific.

0060

2 Q How about OUs? 30871

3 A Yeah, they did work for Petroleum

4 Development Oman, and a lot of work for SEPCO in New

5 Orleans.

6 Q Do you recall if they did work for SPDC?

7 A No.

8 MR. CLARK: No, you can't recall, or no,

9 they did not?

10 THE WITNESS: They did not.

11 MR. BIGIN: Let's mark another Exhibit.

12 (Exhibit No. 2 was marked for identification and

13 was attached to the transcript.)

14 BY MR. BIGIN:

15 Q We're marking Exhibit No. 2. It's

16 identified by Document No. 103850897. It's a

17 March 30th, 2001 E-mail with attachments.

18 Why don't you just take a couple of minutes

19 to familiarize yourself with the document.

20 A Okay. Thank you.

21 (Reviewing.)

22 Okay.

23 Q Great. Do you recognize this document?

24 A I do.

25 Q And do you recognize the attachments as

0061

1 IAIN PERCIVAL

2 well?

3 A I do.

4 Q On the second page of the Exhibit which

5 seems to be the first attachment, was this letter

6 drafted by you?

7 A Yes, it was.

8 Q And do you recall why, why this letter was

9 drafted?

10 A Yes. It's part of what any manager or

11 leader will do to address his community, his staff.

12 Q Was there a change in GIS during this time

13 frame?

14 A There was no physical change in make-up or

15 staff numbers, no.

16 Q All right. Would that be different from a

17 change in the framework? 30873

18 A Would what be different?

19 Q Let me strike that. It might be easier just

20 to look at the document.

21 I have a question about the second para --

22 the first paragraph, second sentence. It says the

23 deliverable for this workshop was an updated version

24 of the GIS 2000 framework.

25 A Yes.

0062

1 IAIN PERCIVAL

2 Q Can you explain to me what that means?

3 A Yeah. The framework was an attempt to

4 connect the staff to the various priorities within

5 STEP, within SEPTAR, within GIS.

6 Q And how was this an update?

7 A The previous year, I think my letter is

8 quite clear, it was put together by myself and the

9 leadership team we talked about before with no input

10 from staff. And this cycle attempted to actually

11 increase ownership by involving the staff in the

12 actual construction of the document.

13 Q I see. In these -- looks like third

14 paragraph, there's a question posed, are we utilizing

15 synergies within GIS to their full extent? Can you

16 tell me what that means, or meant?

17 A Yes. If you go back, you looked originally

18 at the organization chart, which by the way they are

19 put on the paper looks like silos or individual

20 entities, and I was keying that there was more

21 interaction between the various component parts of my

22 organization.

23 Q Are those silos listed on this document?

24 A No, but you referred to them, I think

25 earlier on when you were -- when you looked at the

0063

1 IAIN PERCIVAL

2 organization chart halfway through the last session.

3 They're not on this document, no. No.

4 Well, yes, but they're no longer silos.

5 they're now ellipses.

6 Q I see. Okay. And what was a P&L cluster,

7 or subcluster --

8 A Yeah.

9 Q -- if you will?

10 A At this point in time there was a great

11 drive within, within SEPTAR that we managed ourselves

12 against a P&L to be more, quote/unquote, businesslike.

13 So we had an operating budget, and we had to recover

14 that budget through services.

15 Q So P&L refers to profit and loss?

16 A Profit and loss, yeah.

17 Q And how was your budget set?

18 A On staff count.

19 Q And do you know who set the budget?

20 A This budget was set at STEP level by, by the

21 STEP leadership STEP.

22 Q Could you repeat the last --

23 A Yes, it was -- the budget was set at STEP

24 leadership team level.

25 Q And did you mention there was a team that

0064

1 IAIN PERCIVAL

2 did that?

3 A Well, the leadership team.

4 Q I see. Was GIS compensated by the OUs?

5 A Well, let's clarify the term compensated.

6 There was a tariff for the services provided by STEP

7 that was set at STEP level depending on the level of

8 the individual working, and so an OU was advised this

9 project will cost X, pay X.

10 Q I see. And did that, that monies that the

11 OU paid, did that come out of a common fund, or was

12 that from what the OUs, the profits they generated, if

13 you know?

14 A Each and every OU in the Shell group has a

15 budget for external work to be provided from within

16 Shell or by third parties outside of Shell, and so the

17 remuneration for, say GIS, for SEPTAR, for STEP would

18 come out of that budget.

19 Q Did the OUs engage GIS directly?

20 A They would engage through, through me or one

21 of my delegated, if you like, area focal points. They

22 did not -- it was not a staff-on-staff engagement.

23 That was not part of the rules.

24 Q I see. Can you explain to me, in the fourth

25 paragraph, there's a parenthetical maybe one -- four

0065

1 IAIN PERCIVAL

2 lines down, and it's just a term SEPTAR CVICP? I

3 don't know what that means. Can you explain that to

4 me?

5 A I was looking at it during my review and I

6 thought, gosh, what does that refer to again?

7 Q Uh-huh.

8 A I -- it was do to with customer value,

9 something, something, something.

10 Q I see.

11 A It's -- it's -- what is it, five years on

12 now.

13 Q Sure. Does it seem to you the general

14 thrust was to align SEPTAR customer with the

15 customer's value?

16 A Yes. SEPTAR/STEP was part of the -- of

17 Shell, and so we -- our aspiration was to demonstrate

18 that the work that we were doing was part and parcel

19 of delivering value in concert with the Operating

20 Units.

21 Q And do you know how the Operating Units

22 defined value in this context?

23 A I don't know how they themselves defined

24 value.

25 Q How did GIS deliver customer value?

0066

1 IAIN PERCIVAL

2 A If as a result of our work improvements were

3 made within the Operating Unit and the Operating Unit

4 said to us, under the, if you like, the customer

5 satisfaction, yes, we appreciate the work you've done,

6 and yes, you made a contribution, then we said we have

7 now played a part in value-add in the Operating Unit.

8 Q And do you recall any particular

9 improvements that customers asked of GIS?

10 A They would -- the customer would ask for a

11 service to be done. We always had a -- supplied a

12 customer feedback form, as many service organizations

13 do in any part of the world. And one of the questions

14 would be, have we added value? That was yes or no.

15 And that was where the matter rested as far as we were

16 concerned.

17 Q And did services to your customers include

18 enhancing production?

19 A Yes, but not out of GIS.

20 Q Did they include estimating -- estimating

21 hydrocarbons?

22 MR. CLARK: Objection. Vagueness.

23 Q If you know.

24 A As part of a Field Development Plan, there

25 would be a review made essentially of the in-place

1 IAIN PERCIVAL

2 volumes. You referred earlier to STOIIP, also to gas,
3 and as a result of that estimation shared with -- and
4 worked out with the client, then whatever had to be
5 done would be taken forward based on that estimate.

6 Q Did the OUs provide GIS with CTRs?

7 A Yes.

8 Q And what were those?

9 A Well, the CTR was, if I remember -- it was
10 basically, of course, a time and resource and
11 something or other. But it was the basis for the
12 service to be provided. It was then part of the
13 project management.

14 Q Was that the same as a Term of Reference?

15 A No.

16 Q What was a TOR, or Term of Reference?

17 A The Terms of Reference would actually scope
18 out, if you like, the detail of the work to be done.
19 Whatever the OU wanted done would be specified there,
20 and then that would be appended or affixed to the CTR.

21 Q Did the two arrive together at GIS?

22 A In theory.

23 Q Did they come to you?

24 A To me?

25 Q Yes.

0068

1 IAIN PERCIVAL

2 A Rarely.

3 Q Do you know who they generally went to?

4 A Yes. Each individual project would have a
5 designated project leader. That changed depending on
6 who was busy and who was not. And it was the
7 responsibility of the project leader to ensure that
8 the TOR was signed off by the Operating Unit, by him
9 or her, appended to the CTR and filed appropriately.

10 Q Do you recall specific instances where you
11 did receive CTRs and TOR?

12 A I can't remember specifics.

13 Q Do you recall who the leader was for the
14 OU PDO?

15 A It depended on the project.

16 Q Would that depend on the field, or not

17 necessarily?

18 A Yes, it would be on a field-by-field or even

19 subfield basis.

20 Q Do you recall the leader for particular

21 fields within Oman?

22 A I can't any longer.

23 Q Same question for SPDC.

24 A No. In SPDC the structure was -- we had a

25 tighter structure. And the -- a gentleman called

0069

1 IAIN PERCIVAL

2 Richard Waterland, he was in charge -- he was one of

3 my leaders on the organigram, and he was in charge of

4 all activities in Nigeria, simply because of --

5 Nigeria was more of a challenge to deal with in terms

6 of remuneration and agreement on Terms of Reference.

7 Q And where was he located?

8 A In Rijswijk.

9 Q And why was it a challenge, in those terms

10 you just --

11 A Well, Nigeria is Nigeria. It's a difficult

12 country to work with for many reasons which are in the

13 press and -- you know.

14 Q Political reasons, is that --

15 A Yeah. You have to build relationship and

16 make sure that there is one person who's got an

17 overview and knows what's going on.

18 Q Do difficulties lie in extracting the

19 hydrocarbons from Nigeria?

20 A No, I'm referring to difficulties normally

21 with being paid for services rendered.

22 Q Do you recall if there was a leader for

23 Australia?

24 A I can't. Australia, I can't.

25 Q The same question for Brunei.

0070

2 MR. CLARK: Objection. Lack of foundation.

3 A I just can't remember.

4 Q Okay. Is there a leader for Ormen Langa?

5 MR. CLARK: Objection. Lack of foundation.

6 A Again, I can't remember.

7 Q Okay. Let's flip through the Exhibit. It's

8 the sixth page of the Exhibit?

9 A This same Exhibit?

10 Q Yeah. And the top of the Exhibit says GIS

11 2001 Framework.

12 A Yes.

13 MR. CLARK: I think we've had difficulty

14 with this before. There are three pages in a row that

15 say GIS 2001 Framework.

16 MR. BEGIN: Okay. Yes.

17 MR. CLARK: Or actually four.

18 Q Maybe it's best to look at the bottom.

19 There's a block that says GIS Vision.

20 A Yeah.

21 MR. CLARK: There's two -- at least two

22 pages with the same GIS Vision block.

23 MR. BIGIN: I suggest counsel come from

24 Page 1 to Page 6; isn't that correct?

25 MR. CLARK: I mean look, I'm just trying to

0071

1 IAIN PERCIVAL

2 make sure we're on the same page. One, 2, 3, 4, 5, 6,

3 okay? This is what I got, which I don't think is what

4 you're talking about.

5 MR. BIGIN: No, that's exactly what I'm

6 talking about.

7 MR. CLARK: Oh, I don't see -- oh, so

8 there's three pages with the same GIS Vision block.

9 All right. Great.

10 BY MR. BIGIN:

11 Q All right. As your counsel pointed out, it

12 is confusing. So let's make sure we're on --

13 A Okay, yeah. This one here.

14 Yes.

15 MR. CLARK: Is that what you got?

16 Okay, let's work on that one.

17 A It's the one, for clarification, the GIS

18 Vision now at the top of the page.

19 Q Okay.

20 A The others were at the bottom of the page as

21 it were.

22 Q Okay. Most importantly to me on this page

23 would be if you look in the left column, down towards

24 the end -- bottom, there's a title called

25 Collaboration?

0072

1 IAIN PERCIVAL

2 A Yeah.

3 Q Can you explain to me what the, what this

4 means, emphasize the I in GIS?

5 A The GIS stands for Geoscience Integrated

6 Services, so I wanted to emphasize integrated.

7 Q And how were -- how were you -- were you

8 integrating at this time?

9 A If you recall, I mentioned that I wanted to

10 make sure that the component parts, or the silos, as I

11 referred to them, were actually working as close

12 together as they could and should. And so the whole

13 thrust was to make sure that indeed the component

14 parts did indeed work together.

15 Q And did this include component parts in

16 Houston working together with component parts in

17 Rijswijk, for example?

18 A Could I take you back to the ellipses which

19 indeed were silos --

20 Q Sure.

21 A -- in my mind.

22 It was to ensure that, for example, people

23 working on Basner field studies, actually if they had

24 an issue around, for example, fluid types or fluid

25 characterization actually would ask the relevant

0073

1 IAIN PERCIVAL

2 expert within Rock and Fluid Services. That was what

3 I meant by integration.

4 Q I see.

5 A So integration between the component parts.

6 Q And so this same example would be with

7 EPT-AGH would discuss matters with EPT-AGG, for

8 example? They're in -- the two different ellipses,

9 they could communicate?

10 A They could, but that's not a good example.

11 Q I'm sorry.

12 A That's okay.

13 Q Do you have a better example of who AGH

14 would --

15 A AGR, the Rock and Fluid Services.

16 Q I see. And then if you look there's another

17 heading Collaboration on the other side, in the gray

18 area?

19 MR. CLARK: We're back on the previous

20 document?

21 MR. BIGIN: On the previous page, yeah.

22 Q Do you see what I'm talking about --

23 A Yes, I do.

24 Q -- the second heading?

25 The last bullet point states, make resources

0074

1 IAIN PERCIVAL

2 available. Each cluster to appoint one person who can

3 spend 25 percent of time on collaboration.

4 Do you recall who that individual was?

5 A I can't, no.

6 Q And let's turn one page just prior to this

7 one.

8 A Prior.

9 Q Let's go the other way:

10 A (Complying).

11 Q And underneath there's a heading called

12 Business Trends. Do you see that?

13 A Yes.

14 Q And there's a bullet called Governance?

15 A Yes.

16 Q And it's VAR and the limit processes?

17 A Yes.

18 Q Can you explain why that is underneath

19 Business Trends?

20 A Which? VAR, or the limit, or both?

21 Q I guess both within that bullet.

22 A The VAR, or the Value Assurance Team, that

23 was basically value assurance is what VAR means, also

24 was being, I used the expression bedded in, so it was

25 growing, and we wanted to be sure that there was

0075

1 IAIN PERCIVAL

2 connection with the Value Assurance Team so that

3 anything they came across, we would know about that

4 would be of interest for us to improve whatever

5 services that we were offering.

6 Q Do you recall any instances where that

7 happened?

8 A Again, I can't remember the details, no.

9 Q Was GIS part of the VAR process?

10 A Specifically not.

11 Q How about generally?

12 A No. Maybe the word specifically is wrong.

13 No, it was, if you like, one of the boundary

14 conditions that GIS was not involved in value

15 assurance.

16 Q Do you recall whether or not there were VAR

17 personnel -- or strike that.

18 Do you recall whether or not there was a VAR

19 Team within SEPTAR?

20 A There was.

21 Q Do you recall when that was?

22 A I can't remember when it was set up, but at

23 one point in its existence it was part of SEPTAR,

24 yeah.

25 Q And did GIS work with that team?

0076

1 IAIN PERCIVAL

2 A You'd have to really be more specific about

3 work with.

4 Q Perform work for that team?

5 A No.

6 Q Evaluate work done by that team?

7 A No.

8 Q How did GIS interact with that team?

9 A Through myself and the VAR Team leaders.

10 Q And what interactions do you recall?

11 A Again, I can't remember specifics. It was

12 more around conversations.

13 Q I see. Generally what did you discuss with

14 the VAR Team?

15 A Anything I should know about.

16 Q And how would you define that in that

17 context?

18 A Well, the team leader was a very good friend

19 of mine, and so we would just chat.

20 Q And he would keep you apprised of various

21 VAR studies?

22 A If he felt it was appropriate, but not

23 always.

24 Q Would they be appropriate if GIS was engaged

25 in the area where a VAR study was being conducted?

1 IAIN PERCIVAL

2 MR. CLARK: Objection. Calls for
3 speculation.

4 Q You can answer if you know.

5 A I just don't -- can't, no.

6 Q Okay. Okay. Let's try flipping -- one --
7 two pages ahead from where we just were.

8 A For clarification.

9 Q Yes.

10 A Yeah.

11 Q Thanks.

12 Down towards the bottom of the document
13 there's a title called Value Generation. Do you see
14 that?

15 A Yes.

16 Q The second bullet point has, has, I believe
17 an acronym QBR. Do you know what that means?

18 A Quarterly Business Review.

19 Q Thank you. And at the end of that bullet
20 there is, there's in brackets, all. What does that

21 mean?

22 A All my leaders -- you see them identified by
23 name here -- should be aware of coming out of the
24 Shell, the Shell Quarterly Business Reviews what was
25 happening in terms of reserve additions, production,

0078

1 IAIN PERCIVAL

2 unit technical costs. It was part and parcel of them
3 being like connected and tuned into the business.

4 Q I see. And then value-add in that same
5 bullet is in quotes. Is that defined by the, by the
6 parenthetical that follows?

7 A May I step back and just explain something?

8 Q Please.

9 A Yes. I was extremely clear to my staff that
10 the Operating Units themselves were responsible for
11 any volumetric addition or subtraction, any addition
12 or subtraction to production, any addition or
13 subtraction to the unit technical costs. There were a

14 number of people who thought, well, maybe we should

15 lay claim to that. I said no, the business, the

16 Operating Unit must retain full ownership. But I want

17 us to know what contribution we've been making. So

18 that's why I did the value-add is in, if you like,

19 inverted commas because it was something that I felt

20 was not legitimate to measure within my group. I

21 wanted full awareness of what was happening in the

22 business by them.

23 Q And so these -- is it fair to say these

24 things were how the OUs were measuring the value that

25 GIS was adding?

0079

1 IAIN PERCIVAL

2 MR. CLARK: Objection. Misstates prior

3 testimony.

4 Q Is that correct?

5 A No, it's how the OU actually were measuring

6 how they were doing themselves. That is why the

7 value-add is in parenthesis, because it was not

8 possible to make a one-to-one connection.

9 Q Do you know why there's a, looks like a big

10 arrow to the side, audits and business controls?

11 A (Reviewing).

12 I can't remember anymore.

13 I just can't recall.

14 Q Okay. If you go down towards the bottom of

15 the document there's Collaboration again?

16 A Yeah.

17 Q And can you explain to me what the first

18 bullet, generate proposal and a plan for a, quote,

19 one-stop shop, end quote, by end of Q1 means?

20 A Yeah. You see the name Jim at the end of

21 it, that was Jim Thomas. He was the leader/manager of

22 the Geo -- SGS, which was the Shell Geoscience

23 Services, and he had a particular view on life which

24 didn't quite coincide with my view on life. He

25 reckoned that he wanted to have his own sort of one-

2 stop shop which can provide everything beyond his
3 remit. Going back to my emphasis on integration I put
4 him in charge of looking at, so how can we have some
5 sort of integrated approach to offering a wider range
6 of services by GIS, not by him.

7 Q I see. Was he also a VP?

8 A Was he also with?

9 Q A Vice-President? What was his position?

10 A No, no. He was one layer below me.

11 Q I see.

12 A So he was, I think at the time the
13 terminology was cluster leader.

14 Q I see. And did the one-stop shop come to
15 pass?

16 A No, it did not.

17 Q And the second bullet point, take a leading
18 role in software applications and workflow integration
19 - SEPTAR internal and external software portfolio
20 management, and then it says Iain in brackets.

21 A Yeah.

22 Q Can you tell me what that means?

23 A Yes. At the time, there were an increasing
24 number of very good offerings coming available from
25 Halliburton, Schlumberger, et cetera. And this was

0081

1 IAIN PERCIVAL
2 being seen by quite a number of Shell staff as
3 competition, putting their own particular jobs at risk
4 or under threat, and this was causing some, some
5 angst. And so I said I will take on myself to look
6 indeed at the offerings that are out there and
7 basically demonstrate to you where indeed we can
8 effectively work with the Schlumberger or Halliburtons
9 to add value to the business rather than trying to
10 compete with them. At the time there were step change
11 being made in the business by third- party providers,
12 so there was becoming a decreasing value to Shell, BP,
13 any of the companies to do this sort of work
14 themselves. But it was really a staff issue, to make
15 sure that people weren't becoming seriously concerned

17 Q I see. Do you recall if Petrel was one of
18 those applications?

19 A Yeah, Petrel specifically kicked off this
20 discussion.

21 Q And the last bullet point, coordinate/
22 monitor CSFs for collaboration, Iain?

23 A Critical Success Factors, yeah.

24 Q What was that, critical?

25 A Critical Success Factors, CSFs.

0082

1 IAIN PERCIVAL

2 Q Oh, thank you. Can you tell me what that
3 means?

4 A Yes. Again, if you go back to our
5 discussions around the initial workshop myself and
6 Fred Hoffman ran, just because of the amount of work
7 that was going on it was easy to lose sight of the,
8 like vision that Fred and I had on making sure that we
9 had one community working together. So I said I will

10 take it upon myself at this particular workshop to
11 work with Fred to come up with some way of quantifying
12 how we're doing in terms of collaboration between SEM
13 and GIS.

14 Q I see. Does that category relate to the
15 25 percent time that was projected to be spent on
16 collaboration?

17 A I can't remember now.

18 MR. BIGIN: I know we're about 15 minutes
19 early, but it's a good time for me to take a break
20 before we start again.

21 MR. CLARK: Okay. Do you want to try -- I'm
22 happy to take a break. You want to come back before
23 lunch?

24 MR. BIGIN: That's fine. However long --

25 MR. CLARK: Yeah, because I don't think

0083

1 IAIN PERCIVAL

2 lunch is here.

3 MR. BIGIN: No problem. 30901

4 (Discussion off the record.)

5 VIDEOGRAPHER: This marks the end of Volume

6 1, Videotape No. 1 in the deposition of Iain Percival.

7 We are going off the record. The time 12:16 p.m.

8 (Luncheon recess taken.)

9 AFTERNOON SESSION

10 VIDEOGRAPHER: Here begins Videotape No. 2,

11 Volume 1 in the deposition of Iain Percival. We're

12 back on the record. The time is 1:34 p.m.

13 BY MR. BIGIN:

14 Q Okay. Welcome back.

15 A Okay.

16 Q Were you a member of the Society of

17 Petroleum Engineers between 1999 and 004?

18 A Yes.

19 Q And did you hold a particular position

20 within that society?

21 A Not in that period, no.

22 Q Have you since?

23 A Yes.

24 Q And what position?

25 A I'm called the Director At-Large in the SPE

0084

1 IAIN PERCIVAL

2 Netherlands section.

3 Q Are there certain responsibilities that come
4 with holding that position?

5 A Yeah, I'm charged with setting up a special
6 museum to celebrate 50 years of the oil and gas
7 industry in the Netherlands.

8 Q Very nice.

9 A Yes.

10 Q During the time period we've been talking
11 about, '99 through 2004, did you review any papers
12 written by the SPE?

13 A No.

14 Q Or papers for the SPE?

15 A No.

16 Q Did you author any papers for the SPE?

17 A No.

18 Q Were you asked to consult with the SEC

19 regarding Rule 4-10 while at the SPE?

20 A No.

21 Q Do you recall if there are other members of

22 Shell who are members of the SPE?

23 A I know individuals who are members of SPE,

24 yeah.

25 Q Do you know whether or not they were asked

0085

1 IAIN PERCIVAL

2 to consult on SEC Rule 4-10?

3 A I have no idea.

4 Q Okay.

5 MR. BIGIN: Let's mark our next Exhibit.

6 What are we up to? No. 3.

7 (Exhibit No. 3 was marked for identification and

8 was attached to the transcript.)

9 BY MR. BIGIN:

10 Q I'll ask you just to review the document,

11 and I'll identify the document for the record as

12 Document No. 000100125756. The top line reads Job

13 Application: Head Venture Generation.

14 Do you recall this document?

15 A I do indeed.

16 Q And what is this document?

17 A Within Shell we have an internal open

18 resourcing system. So if new jobs come up, they're

19 posted on the internal web site, and if you are within

20 what's called your posting window, you're free to

21 apply for any job that's out there on the system.

22 Q Did you draft this document?

23 A Yes.

24 Q Do you recall when this draft -- when this

25 document was drafted?

0086

1 IAIN PERCIVAL

2 A I think back -- it must be 2004. I can't

3 quite remember.

4 Q Okay.

5 A Yeah.

6 Q Let me see if I can help refresh your
7 recollection. If you flip to the second page of the
8 Exhibit.

9 A Maybe there's a date. Ah.

10 Q I just noticed there's a date.

11 A There's a date.

12 Q Is that date correct? Does that date
13 correctly represent the date of the drafting of this
14 document?

15 A Yes. No, that's fair enough. It does.

16 Q And can you tell me what Head Venture
17 Generation is? Or was.

18 A It was a position within what was then
19 called EPB, or the new business development part of
20 the upstream, the EP business, and this was one of the
21 senior positions charged with generating new business.

22 Q Do you recall generally why you applied for
23 this position?

24 A Yeah. I had, as I said, we have the system
25 where if jobs come up, you can apply for them as long

0087

1 IAIN PERCIVAL

2 as your boss says, yeah, that's okay, go for it if you
3 want. And I'd been in indeed since approximately
4 beginning '99, and thought, well, maybe I'll just try
5 something else.

6 Q Did you get this position?

7 A No.

8 Q Do you know who did?

9 A Kasper Carsiperstein.

10 Q And do you know where he was located?

11 A In Rijswijk.

12 Q And if you would have gotten this position,
13 would it -- would you be required to have left GIS?

14 A Yes. It was in a different part of EP.

15 Q Okay. And what part of EP was it in?

16 A EPB. I worked for EPT --

17 Q I see.

18 A -- in SEPTAR, yeah.

19 Q Let's go through some of the first paragraph

20 of this document. You wrote, we appeared at a

21 real watershed in Shell's EP business. Correct?

22 A Yep.

23 Q What did you mean by that?

24 A Well, we knew -- the watershed? By that

25 statement?

0088

1 IAIN PERCIVAL

2 Q Correct.

3 A Yes. The -- in particular we were not

4 delivering on the promises that were being made to

5 meet a particular production target or production

6 forecast.

7 Q And do you recall the specific promises?

8 A I can't remember the specific ones, but we

9 were reminded always about there were targets and that

10 they should be met.

11 Q Do you recall where the targets came from?

12 A The Center.

13 Q Did the targets relate to specific OUs?

14 A No, it was the group target.

15 Q And by not being met, do you mean -- did you

16 mean less than what the target was?

17 A Yes.

18 Q Do you recall how much less?

19 A No, I can't remember.

20 Q Do you recall if that target was reported

21 to -- reported in an ARPR, for example?

22 A No. Production is not part of ARPR.

23 Q Where would that number be reported, if at

24 all?

25 A In the annual presentation to the analysts.

0089

1 IAIN PERCIVAL

2 Q And did that come from the Center?

3 A Yes.

4 Q Was GIS asked to assist in that process?

5 A No.

6 Q Did GIS help set those targets?

7 A No.

8 Q Did GIS help meet those targets?

9 A As explained earlier on, we had a portfolio
10 of activities assisting Operating Units to deliver the
11 business, and of course part of the business
12 eventually is delivering oil and gas production. And
13 in ways we helped OUs meet that, meet their
14 deliverables.

15 Q Do you recall whether or not EP missed
16 targets from 1999 through 2002 consecutively?

17 A Which means every year?

18 Q Yeah.

19 A Yes.

20 Q And do you recall how much for each year?

21 A No.

22 Q Do you recall generally how much?

23 A No, I can't remember, but it wasn't the
24 target.

25 Q What do you mean, but it wasn't the target?

1 IAIN PERCIVAL

2 A It wasn't the target.

3 Q You weren't meeting the target; is that

4 correct?

5 A Yes. Yes.

6 Q Sorry.

7 The next sentence you wrote, the promises

8 made by the business over the past few years to grow

9 organically have failed to deliver. I do not

10 understand why some of the elements of the EP

11 portfolio are there. We seem to be betting the farm

12 on Deepwater and generally appear to be -- to believe

13 that technology will ride to our rescue.

14 Can you first tell me what you meant by

15 growing organically?

16 A Growing organically means actually getting

17 more and more out of your existing resource base. The

18 alternative is to acquire.

19 Q Would growing organically include using EOR?

20 A Yes.

21 Q As well as IOR?

22 A Yes.

23 Q Would it also include implementing
24 technology to grow organically?

25 A Yes.

0091

1 IAIN PERCIVAL

2 Q And then after the comma, the first comma in
3 that sentence you stated, I do not understand why some
4 of the elements in the EP portfolio are there. What
5 did you mean by that?

6 A Some fields in some parts of the world.

7 Q You didn't understand why there are some
8 fields in the EP portfolio?

9 A Yes, why they were still there.

10 Q And why is that, or was that?

11 A From my perspective, some fields could
12 deliver more, and some fields were probably rather
13 tired and possibly could be candidates for divestment.

14 Q For divestment?

15 A Yeah.

16 Q Is that a way of saying they weren't

17 economically viable?

18 A No, no, not at all.

19 Q They had come to the end of their life

20 cycle?

21 A We tend to use the expression tired, which

22 means that you may well have to deploy, say more

23 people on a per unit barrel of production than maybe

24 other assets would require.

25 Q And that would increase costs?

0092

1 IAIN PERCIVAL

2 A Yeah.

3 Q Do you recall any examples of those kind of

4 fields?

5 A Not anymore.

6 Q Do you recall in what OUs those fields

7 reside?

8 A No.

9 Q And I'll just ask you, do you recall 0093

10 PDO was one of the OUs where there were tired fields?

11 A They were tiring fields. They weren't

12 completely tired. And that did have upside for IOR/

13 EOR.

14 Q As opportunities?

15 A Yes.

16 Q Do you recall if PDO had targets during the

17 relevant period?

18 A Again, the period in question being?

19 Q 1999 through 2004.

20 A Yes.

21 Q And do you recall what those targets were?

22 A No.

23 Q Do you recall if those targets were met?

24 A During that period?

25 Q Yeah.

0093

1 IAIN PERCIVAL

2 A No.

3 Q Do you recall if GIS was asked to help

4 assist -- strike that.

5 Do you recall if GIS was asked to enhance

6 production at PDO?

7 A They were -- we had quite a number of

8 projects to aid PDO staff get more out of the existing

9 fields, yes.

10 Q And do you recall where that work was done?

11 A That work was done both out of Houston and

12 out of Rijswijk. And at that time out of Aberdeen

13 which had, towards the end of that period, had existed

14 as an entity, yeah.

15 Q I see. Aberdeen wasn't just Deepwater,

16 then; is that correct?

17 A Aberdeen was not Deepwater.

18 Q Not at all?

19 A Nope.

20 Q Did Deepwater reside in SDS?

21 A Yes.

22 Q And then after that second comma you write,

23 we seem to be betting the farm on Deepwater, and

24 generally appear to believe that technology will ride

25 to our rescue.

0094

1 IAIN PERCIVAL

2 Can you tell me what you meant by that
3 statement?

4 A Well, there are, there are two statements
5 there. Which one?

6 Q Let's start with the first part. We seem to
7 be betting the farm on Deepwater.

8 A The Deepwater part of the portfolio was
9 growing, and so by definition, looking ahead, then
10 there was going to be a growing contribution from the
11 Deepwater to the future production forecast.

12 Q And why was that betting the farm?

13 A Well, it was an expression I used that that
14 would be a fundamental part of the future.

15 Q Did you believe that to be a good bet?

16 A It was a bet. I'm not a betting man being a
17 Scotsman, so I'm not too keen on bets.

18 Q Let's go to this -- to the last part. And
19 generally believe that technology will ride to our
20 rescue. What did you mean by that?

21 A Yeah, there was a belief in the company that
22 indeed there would always be a technology around the
23 corner which would appear on time to, to assist in
24 developing fields. This was, by the way, an industry
25 view; it wasn't only specific to Shell.

0095

1 IAIN PERCIVAL

2 Q And how did you form that belief?

3 A As an individual?

4 Q (Nods head).

5 A I'd seen technology fail. I'd seen
6 technology work. And after many years in the
7 business, I knew that there was more than technology
8 required to address issues, problems, challenges.

9 Q Do you recall instances of technology
10 failing?

11 A In my career in Shell? 30917

12 Q No -- well, actually, yes.

13 A During that period, while I was in GIS?

14 Q Uh-huh.

15 A Yes.

16 Q And what technology failed?

17 A If you look at my little mini CV on here,

18 you'll see that I mentioned that I was Chairman of the

19 Board of this Shell/Baker Joint Venture e2-Tech. That

20 was revolutionary technology, what was called

21 expandable tubulars, and I'd seen a number of

22 failures.

23 Q Are expandable tubulars used in deepwater

24 projects generally?

25 A No.

0096

1 IAIN PERCIVAL

2 Q Are they not used --

3 A Let me, let me say at that time no. The

4 technology has moved on, and I believe it is now

5 employed. Not then.

6 Q I see. Before when we were discussing tired

7 fields, do you recall how you learned that certain

8 fields were tired?

9 A Yes. You look at the pressure of the field,

10 you look at what it is producing in terms of oil,

11 water and gas, and you draw your conclusions

12 appropriately.

13 Q And where was that work done?

14 A Well, mostly in the OUs themselves.

15 Q And did GIS also do that?

16 A Well, again, as I said, we -- we're involved

17 in a number of OUs, a number of projects, and of

18 course then you saw the data and drew the appropriate

19 conclusions.

20 Q Later on in this, in the first paragraph you

21 state that this value will be generated by capacity to

22 challenge, appreciation and feel for what works and

23 what does not work in a technology domain, a high

24 degree of intuition involving volumetric estimates and

25 an ability to read an upside and sense bear traps, an

0097

1 IAIN PERCIVAL

2 ability to read people and decide what makes them

3 tick - both Shell staff, motivation, and third

4 parties, business discussions.

5 I'm not quite sure what you meant by that.

6 Maybe we can break it down much like we did with the

7 other paragraph.

8 A Yeah.

9 Q So what did you mean by this value will be

10 generated by capacity to challenge?

11 A This relates really to the role of

12 technology. Within, within the company and in talking

13 to friends of mine in -- working in other companies,

14 it relates back to the belief in technology. To

15 challenge what technology may or may not do does

16 require one to have seen a lot, a lot of situations, a

17 lot of different hydrocarbon settings and say I really

18 wonder if this will work. And there did seem to be an

19 increasing reluctance to challenge whether something

20 would work or not. It must work, mustn't it, would be

21 the question posed, rather than I wonder if it will

22 work, what about X, Y, Z?

23 Q Who posed the question that it must work?

24 A Very often the younger generation; slightly

25 younger than me.

0098

1 IAIN PERCIVAL

2 Q The younger generation of GIS?

3 A Younger generation of staff in Shell, and in

4 many other companies.

5 Q The EP business?

6 A In the global EP business. Remember we're

7 talking about what I like to call the Nintendo

8 generation; generation of people growing up very, very

9 IT-literate, very clever with IT, but what's behind

10 the IT?

11 Q Were there challenge sessions -- strike

12 that.

13 The second part of -- the next part --

14 sentence, appreciation and feel for what works and

15 what does not work in the technology domain. Can you

16 explain that for me?

17 A Well, that relates to what I've just said.

18 Many people say gut feel is just what it is, gut feel

19 and it can be a pain in the gut, a pain in the belly

20 sometimes. But the gut feel is important if you

21 indeed have seen a lot of things in a lot of settings,

22 and it relates back to Generation X coming in and

23 technology will do everything. Say, well, I wonder.

24 Q It seems like what you just, what you just

25 said is consistent with the rest of the sentence as

0099

1 IAIN PERCIVAL

2 drafted here. Do you agree?

3 A With what I just said?

4 Q Do you agree -- it seems as though the

5 sentence to me repeats that you have a high degree of

6 intuition, you're able to avoid bear traps. That's

7 based on your experience, correct?

8 A Yes. Yeah.

9 Q If you look down towards the bottom of the
10 document, Supervisory Experience/Span. There's a
11 bullet at the very bottom. Does that refer to when
12 you were VP at GIS?

13 A You said at the very bottom, the bottom of
14 the page?

15 Q Yes, the final bullet point on the page.

16 A Yep.

17 Q Current job entails managing, et cetera?

18 A Yeah.

19 Q Does that relate to your time at GIS?

20 A Yeah, the staff in GIS.

21 Q Okay. And at the third line down --

22 actually the last line of the document, teams covering
23 Integrated Basin/Field Teams. What are -- what are
24 those things, or what is that thing?

25 A Well, this in fact just enumerates the

1 IAIN PERCIVAL

2 ellipses that we looked at before lunch in the, my
3 organization ellipse. It just enumerates each one of
4 those ellipses actually.

5 Q I see. If you flip to the next page of the
6 Exhibit there's a heading Prior Business Development
7 Experience, and then the second bullet point down,
8 Chairman of the Board for Shell/Baker/Hughes JV and
9 then in quotes, e2-Tech, end quote, '99 -- 1999
10 through 2001.

11 A Yeah.

12 Q What was that?

13 A That was a joint venture between Shell and
14 Baker on the expandable tubulars, and I had as one of
15 my duties whilst working as the VP looking after GIS,
16 I was Chairman of the Board of this small company
17 based in Aberdeen.

18 Q I see. Were you interviewed for this
19 position?

20 A No, I was appointed to the position.

21 I was appointed to the position.

22 Q Oh, yes. For the position of Head Venture
23 Generation, were you interviewed as a result of your
24 job application?
25 A Oh, yes, I was indeed interviewed.

0101

1 IAIN PERCIVAL
2 Q Do you recall the substance of that
3 interview?
4 A No. I recall who the interviewer was, and
5 that Loren Brass, but the substance I can't remember.
6 Q Did Loren Brass discuss any particular
7 issues with you that you recall?
8 A No. He -- we really talked about my time in
9 this EPX 17, which was sort of precursor of the EPB.
10 Q I see.
11 MR. BIGIN: Well, let's mark another
12 document.
13 (Exhibit No. 4 was marked for identification and
14 was attached to the transcript.)

15 BY MR. BIGIN: 30925

16 Q And for the record this is Exhibit No. 4,

17 Document No. 0104410719. Top of the document states

18 2002 Performance (Achievements) Record, Iain D. R.

19 Percival.

20 Please take some time to review the

21 document.

22 A I've -- I've gone through it.

23 Q You finished?

24 A Yeah.

25 Q Do you recognize this document?

0102

1 IAIN PERCIVAL

2 A I do.

3 Q Is this a document that you drafted?

4 A I did.

5 Q And do you recall if this -- why this

6 document -- why you drafted this document?

7 A Yes. It was practice at this time that you

8 wrote up a record of what you had done and what you

9 believed your performance had been, and then you sat
10 down with your supervisor and went into a challenge
11 session.

12 Q This document was not in connection with
13 your job application that we just looked at in the
14 prior Exhibit?

15 A No. No.

16 Q Do you recall when the challenge session
17 took place?

18 A Not exactly when, but the rules stated that
19 it had to be done before the end of January the next
20 year, so it would have happened sometime between
21 writing the document and the end of January 2003.

22 Q Do you recall who the challenge session was
23 with?

24 A Yes, it was with my boss, who was then Paul
25 Sullivan.

0103

1 IAIN PERCIVAL

2 Q Thank you.

3 A Yeah.

4 Q Do you generally recall the challenge

5 session, what was said?

6 A He said I could walk on water and fly, yeah.

7 Q Did he indeed say that?

8 A No. It was about half an hour of can you

9 give me some evidence of this, and so I produced the

10 evidence, yeah.

11 Q I see. Was there -- there is evidence

12 attached to this that are back-up for these various

13 numbered headings that you presented in the

14 performance record?

15 A No, I didn't bring along like a file. It

16 was basically, this is what I did, Paul, and he'd say

17 okay, and -- on the whole, I mean, yes, it was just

18 taken as, fine, I remember this, or -- whatever, you

19 know.

20 Q I see. Did he challenge you on any

21 particular points?

22 A Yeah, the diversity effort.

23 Q What was the diversity effort?

24 A The company had a diversity team which was,
25 yeah, to promote, enhance, be an ambassador for

0104

1 IAIN PERCIVAL

2 increased, in particular, gender diversity in the
3 company, yeah.

4 Q Did it relate to integrating U.S. personnel
5 with Rijswijk personnel?

6 A No. It was much more in what are we doing
7 in ensuring that there is support system for female
8 employees so that we can have an attractive place to
9 work, et cetera, et cetera.

10 Q Let's look at the first numbered paragraph
11 called Client. And you stated in the second sentence,
12 my personal focus has been on personally driving/
13 encouraging improved QA/QM through use of 3DATW,
14 especially project farming.

15 A Framing.

16 Q Framing, thank you.

17 What was -- what does this sentence mean?

18 A QA/QM stands for quality assurance/quality
19 management. Again, I apologize of course for these
20 acronyms, but 3DATW is 3D All The Way, which was an
21 approach which had been developed within GIS to ensure
22 that as you were looking at the project in its
23 entirety, you were -- kept an eye on the technical
24 details, the economic details, the environmental
25 details, if you like, the political details, so that

0105

1 IAIN PERCIVAL

2 you weren't blindsided by one of these aspects of the
3 project management because of focusing too much on
4 something else.

5 Q And do you recall if the 3D All The Way
6 technology was used in Houston?

7 MR. CLARK: Objection. Misstates the prior
8 testimony.

9 MR. BIGIN: You can strike that.

10 Q Do you recall if 3D All The Way was used in

11 Houston?

12 A There was reluctance to take it on in

13 Houston.

14 Q And why was that?

15 A It was different to the embedded ways of

16 working. It was changed management.

17 Q And was that reluctance overcome?

18 A Yeah. There was just a period of discussion

19 and demonstration, and eventually it was taken on

20 board.

21 Q Were you involved in that, in those

22 discussions?

23 A Well, very much so. As it says here, I was

24 personally -- I took it on as a personal task.

25 Q And it was successful, the integration?

0106

1 IAIN PERCIVAL

2 A The integration of these various elements

3 or --

4 Q (Nods head).

5 A Yep. It was an ongoing process, and I saw

6 forward movement. It wasn't a situation of saying,

7 kick box, done.

8 Q And then it looks like you write in the

9 third sentence, I check on this by attending in-person

10 project reviews prior to scheduled client milestones,

11 open paren, VAR, toll gate, etc, closed paren, and

12 project framing at kickoff where I specifically ask

13 questions on technology applications, planned and

14 safety critical activities, open paren, uncertainties

15 wrt fault picking, pressures, composition, etc, closed

16 paren, period.

17 First of all, was this statement correct?

18 A Yes.

19 Q And when you attended the project reviews,

20 what did you do at these reviews?

21 A Ask questions.

22 Q Did you challenge these projects?

23 A I didn't challenge the project. The project

24 was not mine to challenge. The project was put

25 forward by the client, the customer, being maybe SPDC,

0107

1 IAIN PERCIVAL

2 maybe PDO, whoever. But I would challenge the
3 approach, I would challenge -- I would just challenge
4 a number of elements.

5 Q And did you ask other questions?

6 A Yes, I did.

7 Q And as a result of these, what were the,
8 generally the result of these answers that you
9 received?

10 A Well, I'm humble enough to know I don't know
11 everything, and so often there would be a good reply,
12 and say, yeah, that's okay, that holds water. Or
13 there would be a reply that say, well, actually I
14 believe the approach should be X, Y, Z. And my main
15 challenge normally was, have you learned something out
16 of this, are you developing professionally, to the
17 team members.

18 Q And it says in your last statement that you

19 attended 22 such events, and the areas in 2003

20 Houston, there's Rijswijk, Aberdeen, both Bellaire and

21 Woodcreek.

22 A Yeah.

23 Q Do you recall the events that you would have

24 attended in Houston?

25 A I can't remember which projects which -- no,

0108

1 IAIN PERCIVAL

2 I can't do that anymore.

3 Q Was the Woodcreek facility also in Houston?

4 A Yes.

5 Q Do you recall who else attended these

6 events?

7 A I can't recall the actual people, but there

8 would be numbers of the team who would be involved in

9 the project would be there, and if there was a

10 particular technology aspect, we would invite someone

11 from, for example, Fred Hoffman's team to attend or

12 Fred himself, just depending on the actual texture of

13 the project.

14 Q Would Mr. Sullivan be present at these?

15 A No.

16 Q And would the head of the OU be present at

17 these?

18 A No. No, no, no.

19 Q But members from the OU would be present?

20 A Yeah. But I mentioned earlier on the modus

21 operandi was to have Omanis on Oman teams, Nigerians

22 on Nigeria projects. So they would be there.

23 Q If you look down at Point 2, Collaboration,

24 the second sentence, it states two areas I picked up

25 on were, (i), dramatically improving SEM Cluster

0109

1 IAIN PERCIVAL

2 technology implementation. What did you mean by that?

3 A Well, remember we mentioned earlier on SEM

4 was the technology development part of the subsurface,

5 Fred Hoffman's group.

6 Q Uh-huh.

7 A If you recall, earlier on we talked about
8 the emphasis that Fred and I put on the two clusters
9 working together. And so it was under this overall
10 integration we mentioned before lunch Fred and I had
11 it very much on our agreement with Paul that we would
12 make sure that every opportunity was taken to make
13 sure the two clusters worked together and the
14 technology was indeed being used by the GIS people if
15 and when appropriate.

16 Q The second part of that sentence says,
17 increasing use of technology for collaborative
18 working. What does that mean?

19 A It relates to the next bullet point, 1 --
20 no, sorry, Bullet Point 2, VR, this is basically the
21 Virtual Reality Centers. Again, this is making use of
22 new technology developed where in a room twice the
23 size of this people can sit together and be actually
24 inside the reservoir by just projection techniques, et
25 cetera.

1 IAIN PERCIVAL

2 Q Was this -- this technology was used in

3 Houston as well?

4 A There was a VR Center in Houston and one in

5 Rijswijk.

6 Q Did a VR Center require -- strike that.

7 The VR Center, was that at Bellaire

8 Technology Center?

9 A At BTC.

10 Q Did the Virtual Reality Center allow members

11 from Rijswijk and Houston, for example, to

12 communicate?

13 A It was used as a global communication tool.

14 Q And being inside the reservoir, what did you

15 mean by that?

16 A It means you can actually almost relate to

17 walking about inside a coal mine, which you can do of

18 course. By projection techniques you can actually

19 virtually walk -- look and walk inside the reservoir.

20 Q And how was that used?

21 A It was used mainly for plotting well tracks.

22 Q Was it used to assess the mobility of
23 hydrocarbons?

24 A No.

25 Q What are well tracks?

0111

1 IAIN PERCIVAL

2 A The path of a well. That technology allowed
3 you to -- excuse me for moving my arms now -- to
4 actually dot and trace the well in three-dimensional
5 space and see indeed if it would arrive where you
6 wanted it to arrive, and if indeed the track you had
7 chosen was physically possible to drill. And it was a
8 way of bringing well engineers and petroleum engineers
9 and geologists together to actually look at what the
10 plan would do in virtual real life.

11 Q I'm curious. Did you have to wear special
12 apparatus when you were in this room?

13 MR. CLARK: Objection. Relevance. I
14 desperately want to know, too.

15 MR. BIGIN: It's a valid objection.

16 MR. CLARK: No, I want to know. Did you

17 have to wear glasses or something?

18 A The glasses -- just for your interest, in

19 those days, yes. Now it's move on, you don't have to

20 do that anymore.

21 Q Thank you for indulging.

22 Let's take a look at Point 2 under

23 Collaboration. There's another paragraph that has a 2

24 in front of it. It mentions that you co-sponsored a

25 Nigeria Seamless Team; is that correct?

0112

1 IAIN PERCIVAL

2 A Yes.

3 Q And what was that?

4 A This was an effort to gather as much

5 collaboration between the people working in Rijswijk,

6 in GIS in wells, in production, working closely with

7 their opposite numbers in SPDC, which is the Shell

8 Petroleum Development Company in Nigeria, to basically

9 improve performance across the board.

10 Q When you say performance across the board,

11 what do you mean by that?

12 A Production, gas management, a lot of HSE

13 made especially for Nigeria, field development

14 planning.

15 Q Later in that paragraph, the second

16 sentence, there is a parenthetical stating gas/oil

17 portfolio options, achieving production targets,

18 reserve booking, asset integrity. Are those the

19 things that were trying to be improved by the Seamless

20 Team?

21 A Yes.

22 Q Do you recall if there were Houston members

23 on that Seamless Team?

24 A No. I do recall, and there were not Houston

25 members on that team.

0113

2 Q Thank you.

3 And you mention that the work in the interim

4 has not been easy. Do you recall why?

5 A There were technology issues because the

6 Seamless Team working required as making a lot of use

7 of telephone and video links, and communication with

8 Port Harcourt in particular was just very difficult,

9 their technology. And yeah, there were -- it was

10 just -- the whole concept was new. Something new is

11 normally treated with some circumspection, and so

12 again there was a lot of effort put into, if you like,

13 change management which of course went at the cost of

14 doing other things. There are only 24 hours in the

15 day.

16 Q And was the technology being used for

17 reserve booking?

18 A Which technology?

19 Q The technologies of the Seamless Team.

20 A Well, the technologies that I referred to

21 were basically telephones and video links. That

22 technology, just making sure that you could speak

23 regularly with your team members who ~~were~~ sitting in

24 Nigeria, or if you're in Nigeria, your team members

25 sitting in Rijswijk.

0114

1 IAIN PERCIVAL

2 Q And earlier in this sentence there was at

3 this first meeting challenge the emphasis on achieving

4 number of RTL. Do you recall what you meant by that?

5 A Yes. The -- there was within Shell, and

6 within many of the other EP companies, a thing called

7 Reaching The Limit, and basically this meant improving

8 performance on drilling wells, on achieving

9 production, on coming up with smart engineering

10 concepts. And the challenge was, Nigeria said, we

11 will do, I can't remember the number, it was a large

12 number, and the challenge was that's just not

13 possible.

14 Q Meeting the number was not possible; is that

15 correct?

16 A Well, they wanted to do X, and X was -- I

17 can't remember the number, it was a large number, and

18 we said no, come on, let's be real, let's shoot for

19 fewer.

20 Q Did they adjust that number downward as a

21 result of --

22 A Yeah, they did.

23 Q And do you recall if you met the lower

24 number?

25 A I can't remember.

0115

1 IAIN PERCIVAL

2 Q You also reference at the end of this

3 paragraph that you attended two face-to-face and two

4 virtual meetings in 2002 regarding this.

5 A Yeah.

6 Q Do you recall what -- the substance of those

7 meetings?

8 A They normally were reviews, and how are we

9 getting on, how are things going, why have personnel

10 changed, et cetera, et cetera. 30943

11 Q Did you review certain fields during those
12 meetings?

13 A No -- well, it was not a field-specific
14 thing. It was more a, a capability improvement,
15 overall organizational capability team.

16 Q And do you recall who else was on the
17 Nigeria Seamless Team?

18 A The individual members I can't remember. I
19 do remember my, obviously my, my partner in Nigeria, I
20 do remember him.

21 Q Is that Jerry Vertal?

22 A No. I took over from Jerry Vertal. He was
23 the Rijswijk representative. It was a gentleman
24 called Mr. Barry.

25 Q Did the Nigeria Seamless Team disband at

0116

1 IAIN PERCIVAL

2 some point?

3 A Yes.

4 Q Do you recall when?

5 A I can't remember when. It more than
6 disbanded. Just sort of, I think I used the word
7 withered on the vine before; it just sort of went
8 away.

9 Q Was that A result of the realignment?

10 A Which realignment?

11 Q 2003.

12 A I'm not quite sure which 2003 realignment
13 we're talking about.

14 Q How about, why did it wither away?

15 A I just can't remember.

16 Q Was a new team formed?

17 A SPDC themselves put together, later on, a
18 new way of working; some more focus in what they were
19 doing, and that seemed to be appropriate.

20 Q And were you part of that team?

21 A No. No. This was a team in Port Harcourt.

22 Q Do you recall around what time that
23 occurred?

24 A Around 2004.

25 Q I see. At the next point you mention STEP

0117

1 IAIN PERCIVAL

2 50 event. Do you know what that is, or was?

3 A Yes, that was again the Shell Technology EP

4 leadership team, and so 50 senior people in STEP,

5 i.e., the 50 senior people working for John Darley

6 came together in Houston.

7 Q And you were part of this senior 50?

8 A Yeah.

9 Q And you also mention bringing together GIS

10 from SEPTAR, and EDP from SDS. This occurred in 2002?

11 A Yes.

12 Q What was EDP?

13 A It was part of SDS, and I actually can't

14 quite remember what that stood for anymore.

15 Q After, after that division was brought in

16 SDS still existed on its own?

17 A Well, as you see here, there's EP Solutions,

18 and EP Solutions was formed from GIS and the

19 subsurface petroleum engineering part of SDS. And the
20 engineering part went to become part of Global
21 Projects.

22 Q Do you recall applying for a position VP
23 CATTS in EP Solutions?

24 A Yep.

25 Q And do you recall whether or not this was

0118

1 IAIN PERCIVAL

2 around May 2003?

3 A Yes.

4 Q Yes, it was around May?

5 A It was indeed, yeah.

6 Q And what is VP of CATTS?

7 A C -- stands for Capability and Technology
8 Team; the last T is team. So Capability and
9 Technology.

10 Q And why did you apply for this position?

11 A As it says here, EP Solutions was to be this

12 new entity. This was all part of the reorganization

13 of the entire EP sector going on at this time. So

14 the -- SEPTAR itself went away, and GIS as part of

15 SEPTAR also went away as an entity, so my job went

16 away, so I had to apply for a new job.

17 Q Did you get this job?

18 A I didn't.

19 Q What new job did you get instead?

20 A The Global Leader of Hydrocarbon Maturation.

21 Q Do you recall something called the Godfather

22 role?

23 A Yes.

24 Q What is that? What's that?

25 A The Godfather role was an unofficial name

0119

1 IAIN PERCIVAL

2 for the, the senior discipline engineer or geologist

3 in the old Shell organization that was disbanded in

4 1994, '95. So you would have a global head of

5 reservoir engineer, a global head of geology, a global

6 head of projects -- well, there are a whole bunch of
7 global heads. And they were known by us, the troops,
8 as the Godfathers. Not to their faces, but that's
9 what they're referred to as.

10 Q And did you refer to yourself as a Godfather
11 of PDO?

12 A To PDO?

13 Q To PDO.

14 A No.

15 Q Were you a Godfather for PDO PE Scholars?

16 A During my tenure in PDO, one of my jobs was
17 to look after the PE, the young Omani PEs who were
18 studying in the States on a whole.

19 Q And did they study at the BTC?

20 A No, no, they studied at Carruther School of
21 Mines, University of Texas, et cetera, et cetera, et
22 cetera.

23 Q And when were you with the PDO?

24 A That was during my, my job in PDO which went
25 from 1985 to 1991.

1 IAIN PERCIVAL

2 Q I see.

3 MR. CLARK: In the next ten minutes, Mike,
4 if you want to take a break. No hurry. Whatever is
5 convenient.

6 MR. BIGIN: Thanks, Chris. I think now is
7 actually a pretty good time for a break.

8 MR. CLARK: Terrific.

9 MR. BIGIN: Let's go off the record.

10 VIDEOGRAPHER: We are going off the record.
11 The time is 2:25 p.m.

12 (Break taken.)

13 (Exhibit No. 5 was marked for identification and
14 was attached to the transcript.)

15 VIDEOGRAPHER: We are back on the record.
16 The time is 2:51 p.m.

17 BY MR. BIGIN:

18 Q We've marked as Exhibit No. 5 a document
19 identified by number 0104106242. It's an E-mail dated
20 3/24/2000 with an attachment.

21 Mr. Percival, take a couple of minutes to

22 familiarize yourself with it.

23 A Okay. Yes.

24 Q Thank you.

25 A (Reviewing.)

0121

1 IAIN PERCIVAL

2 Okay.

3 Q Okay. Do you recall this document?

4 A I do now, yeah. Yep.

5 Q Okay.

6 A Yeah.

7 Q On the first page of the Exhibit in the

8 subject line notes message on behalf of Fred Hoffman

9 and Iain Percival. Was this message sent on your

10 behalf?

11 A Yes.

12 Q And can you generally describe what the

13 message was?

14 A Well, it's part of the input to the, 10051k

15 it's the highlights, monthly highlights which were

16 developed within SEPTAR, within STEP, picking out

17 highlights of studies, or technology, or whatever.

18 And this one is essentially demonstrating the impact

19 of doing core and fluid analysis.

20 Q And that's from the Cores Group?

21 A From the CORES Team, yes.

22 Q And they were part of GIS; is that correct?

23 A Yes. Yes.

24 Q And the SEPTAR highlights, how often did

25 they come out?

0122

1 IAIN PERCIVAL

2 A Monthly highlights, at that time.

3 Q And was GIS required to contribute to those

4 highlights every month?

5 A Yes.

6 Q If you flip to the second page of the

7 Exhibit.

8 MR. CLARK: Third.

9 A I guess the one after the little --

10 Q Oh, apologies. You apparently have three
11 pages.

12 A Yeah.

13 Q I believe it's the attachment to the E-mail.

14 If you look at the last heading, Proved Ultimate
15 Recovery Increase for Ghafeer Oil Discovery?

16 A Yep.

17 Q What does that mean?

18 A It -- little story is around the
19 contribution which an improved description of the
20 rocks have contributed indeed to revision to an
21 estimate of volumetrics.

22 Q And was this study done by the CORES Team?

23 A The study on the rocks would have been done
24 by the CORES Team. The information then sent back to
25 PDO, who then have said, okay, this means that bring

2 this into the calculations, the end result is,

3 whatever it is.

4 Q I'm sorry, was there a second group involved

5 besides the CORES Team?

6 A No -- well, the Field Team in PDO, whoever

7 was looking after this particular accumulation,

8 because indeed this information would have been, or

9 the analysis of the rock would have been done on

10 behalf of PDO, on behalf of the Field Team, and then

11 sent back to them, simply because the CORES Team

12 within GIS cannot do reserve estimation themselves.

13 It's just not in the rules of the, of their business.

14 Q Do you recall whether or not the Field Team

15 contains GIS members?

16 A I can't remember what the make-up was then.

17 Q Can you tell me why this was a SEPTAR

18 highlight?

19 A Yes. We were asked always to demonstrate

20 the impact of technology, or the impact of a

21 particular contribution to a study in terms of, I

22 think we talked about it maybe before lunch, in terms

23 of value-add to the group. And so a highlight
24 obviously was having heard from the Field Team in Oman
25 that they had done a revision as a result of improved

0124

1 IAIN PERCIVAL

2 rock definition, so obviously the guys and the girls
3 feel pretty good about that.

4 Q And it seems there was a -- measurements can
5 be credited with a ten percent of the total ultimate
6 recovery increase representing a value of
7 15.8 million. Is that the highlight?

8 A Well, the highlight is the whole paragraph.

9 Q I see. And did the CORES Team come to the
10 conclusion that the data will be -- will also --
11 excuse me. Strike that.

12 Did the CORES Team come to the conclusion
13 that the data will also be used in new reserves
14 bookings and in reserves revisions in the future, the
15 last sentence of that blurb?

16 A This is feedback from the team who say

17 that -- this is the Field Team who say we will use

18 this data in terms of using it in analogs, for

19 example.

20 Q What's an analog?

21 A Something which looks the same.

22 Q Something that's the same as what the CORES

23 Team did?

24 A No. It's the -- under the SEC definition,

25 they talk about analogous reservoir geological

0125

1 IAIN PERCIVAL

2 settings in terms of reserve bookings. And so PDO

3 would be looking for analogs. What you do not do is

4 you do not cull every field. So this data would be

5 used at the discretion of the Field Team to do what

6 they wanted to do with it.

7 Q And when you mentioned SEC before, what were

8 you referring to?

9 A To the Stock Exchange Commission.

10 Q Was there a particular rule you were

11 referring to?

12 A It's when we look at the use of field

13 analogs in terms of reserve bookings, they're -- it's

14 quite specific on the use of analogs.

15 Q And what kind of reserve booking would that

16 be?

17 A For proved reserve booking.

18 Q And do you recall the SEC rule that related

19 to that?

20 A The actual paragraph I can't -- I can't

21 recall.

22 Q Do you recall the name of the rule

23 generally?

24 A Well, it was referred to as the field analog

25 rule.

0126

1 IAIN PERCIVAL

2 Q I see. Was it -- do you recall if it was

3 part of a larger rule regarding proved reserves?

4 A It's part of the, of the specificities in
5 the SEC on things you can do to book reserves.

6 Q And besides the specificities, do you recall
7 the general rule, the -- of the SEC for this?

8 A Well, of course there are any number of, if
9 you like, bullet points or rules from SEC, and this is
10 part of it which addresses the use of analogs.

11 Q And you don't recall which part?

12 A No.

13 Q Above that there is the title More Oil From
14 Transition Zones.

15 A Yeah.

16 Q Can you tell me what that means?

17 A Yeah. And apologies for the technical
18 stuff, but --

19 Q No problem.

20 A -- in oil field it's very often to have oil
21 sitting on top of water. That's just the way the
22 accumulation is. Depending on the type of rock,
23 depending on the type of oil, you have a zone which
24 is, if you like, a mixture of oil and water. That's

25 called, then, the transition from water to oil.

0127

1 IAIN PERCIVAL

2 Q Is -- was that transition zone created by
3 pumping water into the well?

4 A No, it's a natural phenomenon. It's the
5 natural state of the reservoir.

6 Q There's a bolded section that says our
7 results show there is a big scope for recovery,
8 50 MMbbl.

9 Do you recall whose results those are?

10 A PDO's.

11 Q In the first sentence, the mobility of oil
12 in transition zone has been studied for a second year
13 to assess the scope of oil recovery for the Lekhwair C
14 field in PDO. Do you recall where that -- where those
15 studies took place?

16 A I can't recall if it was Houston or Muscat.

17 Q What, if you know, does the last sentence

18 mean, without this study this field would not have

19 been developed?

20 A Yeah, this is clear. The transition zones

21 are very difficult to interpret. Unless you actually

22 have real rock to look at and real rock to analyze, it

23 can be, well, near impossible. But when you have the

24 rock and you have analyzed it, as in this case, you

25 can then say, it's rather akin to walking around

0128

1 IAIN PERCIVAL

2 inside the reservoir I mentioned before the break.

3 You then say, I've seen the rock, I've done

4 experiments, and I know it can move.

5 Q Do you know if this became part of a Field

6 Development Plan?

7 A I can't recall.

8 Q Are you familiar with the field in Australia

9 called Gorgon?

10 A I know the field name. I'm not familiar

11 with it.

12 Q Do you recall if GIS worked on the field?

13 A I can't remember.

14 Q Did SEPTAR work on the field?

15 A Again, I can't remember.

16 Q Are you familiar with the Ormen Langa field?

17 A Again I know what the Ormen Langa field is,

18 yeah, but again, I'm not familiar with the details of

19 the field.

20 Q Did GIS work on that field?

21 A I can't recall.

22 Q Did SEPTAR work on that field?

23 A There was seismic work done on the field in

24 SEPTAR.

25 Q And who did that seismic work?

0129

1 IAIN PERCIVAL

2 A Within SEM.

3 Q And where was that work done?

4 A In Rijswijk.

5 Q And who did that work? 30961

6 A I can't remember.

7 Q And when was that work performed?

8 A Again, I don't know.

9 Q Did GIS do work for the Venezuela OU?

10 A Sorry, the Venezuela?

11 Q Venezuela OU.

12 A I'm just thinking was there an OU, there was
13 an OU, and yes, there was work done for Venezuela.

14 Q And do you know who did that work?

15 A The individuals I can't remember, but it
16 would have been Lyle's group, yeah.

17 Q And so was that work done in Houston?

18 A That work was done in Houston.

19 Q Do you know when that work was performed?

20 A Well, it was during my tenure as the leader
21 of GIS, but which particular months or year, I can't
22 remember.

23 Q Do you recall the outcome of that work?

24 A Well, which part of the Venezuela work are
25 you referring to? There's more than one project.

0130

1 IAIN PERCIVAL

2 Q How many projects were there for Venezuela?

3 A Two to my memory.

4 Q Did GIS work on both those projects?

5 A Yes.

6 Q What was the name of the first project?

7 A One was the offshore gas development, which

8 has changed its name several times, but we knew it as

9 Mercosaur, I think.

10 Q Okay. And do you recall the results of the

11 GIS work on that -- is it a field?

12 A It's three fields.

13 Q Okay. Do you recall the result of the work

14 on those three fields by GIS?

15 A I can't remember because the work stopped

16 because of political stuff.

17 Q Do you recall when the work began?

18 A No.

19 Q Do you recall when the work stopped?

20 A I can't -- I can't recall exactly. It 30963

21 related to Chavez coming in.

22 Q Did the work also involve SDS?

23 A No.

24 Q And what was the name of the second group?

25 A I can't remember the field name but it was a

0131

1 IAIN PERCIVAL

2 in Lake Mirakible, which is the geographical area,

3 yeah.

4 Q And GIS worked on that?

5 A Yes.

6 Q GIS Houston specifically?

7 A Well, GIS Houston only.

8 Q And do you recall the results of that work?

9 A It was concluded in terms of a Field

10 Development Plan was written by the group in Caracas,

11 the Shell development team down in Caracas.

12 Q And do you recall when that happened?

13 A I can't remember the dates.

14 Q For the start or the end of that work?

15 A No.

16 Q Do you recall whether or not GIS worked for

17 the Brazil OU?

18 A I can't recall.

19 Q Do you recall whether or not SEPTAR worked

20 for the Brazil OU?

21 A I can't recall details on that.

22 Q How about for the Mars field? Does that

23 help?

24 A Mars?

25 Q (Nods head).

0132

1 IAIN PERCIVAL

2 A Yes, work was done by GIS on Mars.

3 Q Was the Mars field part of Brazil? Maybe

4 I'm incorrect.

5 A No. Mars is the Gulf of Mexico.

6 Q Oh.

7 A Yeah.

8 Q And what OU was that, then?

9 A SEPCO.

10 Q And did the Houston GIS work on that
11 project?

12 A Yes.

13 Q And do you recall when?

14 A Again, the start and finish dates I can't
15 recall.

16 Q Would that have been Lyle Henderson's group
17 as well?

18 A That was not. The actual work was done by
19 the SEPCO field engineers, and this was specific work
20 done on fluid typing by the Fluid and CORES Team.
21 Geochemical work.

22 Q Did you say pure chemical work?

23 A Geo, geochemical work.

24 Q And do you recall the results of this work?

25 A Yeah. The work was done to identify whether

1 IAIN PERCIVAL

2 from geo -- something called geochemistry
3 fingerprinting production from a particular horizon
4 could be identified.

5 Q Did this result in a Field Development
6 Plan?

7 A No. It was part of what is called in the
8 business reservoir management. It wasn't a Field
9 Development Plan per se, it was part of an ongoing
10 plan. It was to improve the management of the field.

11 Q Do you recall whether or not GIS performed
12 work in Malaysia?

13 A They did some work in Malaysia.

14 Q And do you recall what work?

15 A It was part of an EOR screening exercise
16 conducted with Chattagole (phonetic) which is the
17 operating arm of Petronus (phonetic), the state oil
18 company.

19 Q And was Houston GIS involved?

20 A It was Houston GIS.

21 Q And do you recall the results of that work?

22 A The actual work was to identify a particular

23 E -- enhanced oil recovery, EOR techniques. And a

24 presentation was made and Petronus said thank you.

25 Q Did it result in FID -- not FID. Strike

0134

1 IAIN PERCIVAL

2 that.

3 Did it result in a Field Development Plan?

4 A No, it did not.

5 Q Do you recall whether or not GIS did work in
6 the Philippines?

7 A To the best of my recollection they did not.

8 Q How about on the Malampaya Oil Rim?

9 A Well, that is the Philippines.

10 Q Did that help your recollection, me naming
11 the --

12 A I know work was done in SEPTAR, and I
13 believe it was done by Wells and the SEM group.

14 Q Was that work done in Houston, do you
15 recall?

16 A I can't remember.

17 Q Okay.

18 MR. CLARK: Mike, just as a heads-up my call

19 is going to be in four minutes.

20 MR. BIGIN: Okay. Let's go off the record.

21 VIDEOGRAPHER: We are going off the record.

22 The time is 3:11 p.m.

23 (Break taken.)

24 VIDEOGRAPHER: We are going back on the

25 record. The time is 3:31 p.m.

0135

1 IAIN PERCIVAL

2 BY MR. BIGIN:

3 Q Okay. Mr. Percival, do you recall whether

4 or not GIS did work for PDO?

5 A They did, yes.

6 Q And do you recall the nature of that work?

7 A I think we've already covered a variety of

8 contributions to development plans and specialists

9 work, such as the core analysis, fluid analysis.

10 MR. BEGIN: Let's mark another Exhibit.

11 (Exhibit NO. 6 was marked for identification and

12 was attached to the transcript.)

13 BY MR. BEGIN:

14 Q And for the record Exhibit 6 is Document No.

15 0104790710, with attachments. I'll ask the witness to

16 take a couple of minutes to review the document.

17 A Okay. Thank you.

18 (Reviewing.)

19 Yep. Okay.

20 Q The Exhibits that -- excuse me, the

21 attachments that you're just looking through, are

22 those Terms of References that we've talked about

23 earlier?

24 A Yeah, these are typical examples of a Term

25 of Reference, yeah.

0136

1 IAIN PERCIVAL

2 Q Do you recall whether or not you reviewed

3 those Terms of Reference?

4 A I can't recall.

5 Q The first page of the Exhibit has a list of
6 studies. What I'd like to do is go through each study
7 and see if you recall if GIS was involved and where
8 those studies took place. Okay?

9 A Uh-huh.

10 Q Okay. The first -- the first study I
11 believe is the Fahud Natih EFG NW-S.

12 A Yes.

13 Q Do you recall that study?

14 A Yeah, that's two separate fields, Fahud and
15 Natihes.

16 Q And do you recall where those studies took
17 place?

18 A This one I can't recall.

19 Q Do you recall if GIS was involved?

20 A Yes, GIS, but I can't recall if it was
21 Houston or if it was Rijswijk.

22 Q Do you recall if -- the results of these
23 studies?

24 A No.

25 Q The next one is Natih Trail end. Do you

0137

1 IAIN PERCIVAL

2 recall that study?

3 A It's Natih Tail, Tail end, so end of field

4 life, yeah, tail end production.

5 Q I see.

6 A Yeah.

7 Q Do you recall that study?

8 A No, not specifically.

9 Q Do you recall it more generally?

10 A No. It would have been done, but whether it

11 was in Houston or Rijswijk, I can't remember.

12 Q Do you recall if GIS was involved?

13 A Yes.

14 Q Do you recall the results of the study?

15 A No.

16 Q The next one is Lekhwair Upper Shuaiba?

17 A Upper Shuaiba, yeah.

18 Q All right, I took a shot.

19 Do you recall that study?

20 A Yes, I do.

21 Q Do you recall if -- where it was done?

22 A That was done in Houston.

23 Q And was that done by GIS?

24 A That was done by GIS in Houston.

25 Q And did that result in a Field Development

0138

1 IAIN PERCIVAL

2 Plan?

3 A It resulted as input to a Field Development

4 Plan, yes.

5 Q Do you recall if it quantified reserves?

6 A It was -- no, this was to quantify a

7 fracture model, which PDO themselves took into their

8 reserves booking.

9 Q What is a fracture model?

10 A Working out indeed how cracked or broken the

11 rocks are.

12 Q And does that interfere with production?

13 A No. It can actually enhance production if

14 you know proper the distribution of the fractures.

15 Q And GIS worked on determining the proper

16 distribution of those fractures?

17 A They did.

18 Q The next study is Zauliyah?

19 A That's close.

20 Q Okay. Do you recall that study?

21 A I do.

22 Q Do you recall if GIS was involved in that

23 study?

24 A GIS did it, yes.

25 Q And do you recall where?

0139

1 IAIN PERCIVAL

2 A In Rijswijk.

3 Q And do you recall the results of that study?

4 A I do.

5 Q And what were they?

6 A It was designing a new water flood approach
7 to the field.

8 Q Did that result in a Field Development Plan?

9 A Again, it was input to a Field Development
10 Plan, which was then completed by PDO and they take
11 the work then forward.

12 Q Did that study quantify reserves?

13 A There would have been a volumetric reward
14 associated with the water flood.

15 Q What is a volumetric reward?

16 A It would associate an amount of oil to be
17 recovered from that water injection.

18 Q Would it propose additional methods of
19 production?

20 A No. It would -- this particular one was
21 targeted at the positive impact of water flooding.

22 Q Uh-huh. The next study is Al Gubar. Do you
23 recall that study?

24 A I do.

25 Q And do you recall if GIS was involved?

0140

1 IAIN PERCIVAL

2 A GIS and SEM were involved in this one.

3 Q Do you recall where the work took place?

4 A I can't remember on that one.

5 Q Okay. Do you recall who was involved?

6 A Individuals?

7 Q Yes.

8 A No, not the actual team members, no.

9 Q Do you recall the result of the study?

10 A This was part of the EOR, the Enhanced Oil
11 Recovery scouting program, which went then into the
12 longer-term planning of PDO's production forecast.

13 Q Did this, did this study result in a Field
14 Development Plan?

15 A It would have done.

16 Q Do you recall what the forecast was?

17 A No, I cannot. No.

18 Q Do you recall if PDO met that forecast?

19 A For this specific field?

20 Q Uh-huh.

21 A I can't remember.

22 Q The next one is Ghaba North. Do you recall
23 that study?

24 A That was a hundred percent correct, that
25 pronunciation.

0141

1 IAIN PERCIVAL

2 I do remember, yes.

3 Q Was GIS involved?

4 A Yes.

5 Q Do you recall the result of that study?

6 A No, I don't.

7 Q Do you recall if -- where the study took
8 place?

9 A I can't remember which location it was.

10 Q Do you recall individuals?

11 A No.

12 Q Do you recall a time frame for this study?

13 A No.

14 Q Let me go back to the Lekhwair study. Do

15 you recall the time frame of that study?

16 A No, I can't remember the precise timing for

17 that one, no.

18 Q It was during your tenure at GIS?

19 A It was during my tenure, yeah.

20 To prevent sort of repetition, they were all

21 during my tenure, these studies.

22 Q Thank you. Do you recall exact dates for

23 any of the ones we've spoken about?

24 A No.

25 Q Or even general years?

0142

1 IAIN PERCIVAL

2 A No. This was a program that rolled on

3 indeed through '92, '93, '94, yeah.

4 Q Let's move on to Amin.

5 A Yes.

6 Q Do you recall that study?

7 A I do.

8 Q And was GIS was involved?

9 A Yes, they were.

10 Q Do you recall where?

11 A I can't remember exactly where.

12 Q Do you recall the results of the study?

13 A No.

14 Q Do you recall the Birba study?

15 A Yes.

16 Q And was GIS involved in that study?

17 A They were.

18 Q And do you recall where that study took
19 place?

20 A That was one that was conducted in both
21 locations.

22 Q Do you recall when that study took place?

23 A Which year, I can't remember.

24 Q Was it during -- while you were at GIS?

25 A Yes.

1 IAIN PERCIVAL

2 Q Do you recall the results of that study?

3 A This study was a particular EOR study.

4 Q Did it result in a Field Development Plan?

5 A It did.

6 Q Did it set a target for production?

7 A There would have been, again, a target
8 volume associated with the Field Development Plan.

9 And there would also have been, because this is a
10 typical output from a Field Development Plan, there
11 would have been a production forecast.

12 Q Is that response consistent for all Field
13 Development Plans?

14 A Yes, that's an output of a Field Development
15 Plan.

16 Q Karim West, do you recall that study?

17 A Yes.

18 Q Was GIS involved?

19 A Yes.

20 Q Do you recall where?

21 A Rijswijk.

22 Q And do you recall the results of that study?

23 A Field Development Plan.

24 Q And Marmul Al Khalata?

25 A Yeah.

0144

1 IAIN PERCIVAL

2 Q You recall that study?

3 A Yes, I do.

4 Q Do you recall if GIS was involved?

5 A They were.

6 Q And do you recall where?

7 A Rijswijk.

8 Q And the results of that study?

9 A Field Development Plan revision.

10 Q And why was that a revision?

11 A Because all of these fields have been around

12 for some time and they've all had field development

13 plans. We're looking at second, third, even fourth

14 revision of development plans.

15 Q Why is a Field Development Plan revised?

16 A As a result of history of additional

17 knowledge of production.

18 Q Was it to increase output from the field?

19 A No. It was to reflect whether there was

20 more or less coming out of the field, and with indeed

21 additional knowledge and technologies, if new

22 technology in particular in enhanced oil recovery

23 could be applied to whichever accumulation it was.

24 Q Do you recall whether or not this revision

25 resulted in less, as you said?

0145

1 IAIN PERCIVAL

2 A I can't remember.

3 Q Do you recall for the studies that we spoke

4 about so far whether or not the revisions resulted in

5 less output?

6 A No, I can't remember if there were positives

7 or negatives on a field-by-field basis.

8 Q I see. Do you recall generally for PDO?

9 A No. That would just be further speculation.

10 Yeah, I can't.

11 Q Okay. Nimr C.

12 A Yeah.

13 Q Do you recall that study?

14 A I do.

15 Q And was GIS involved?

16 A They were.

17 Q And do you recall where?

18 A That was Rijswijk.

19 Q And do you recall the results of that study?

20 A Again, a revised Field Development Plan.

21 Q And do you recall the timing of that, when

22 that study took place?

23 A Again, just during my, my tenure.

24 Q Okay. And how about Nimr G?

25 A Yep, same. That was conducted in Rijswijk.

0146

1 IAIN PERCIVAL

2 Q And do you recall the results of that study?

3 A That was a revision to a Field Development
4 Plan.

5 Q And Rahab, do you recall that study?

6 A I do.

7 Q And did that take place at GIS?

8 A In GIS, in Rijswijk.

9 Q And do you recall the results of that study?

10 A Again, revision to Field Development Plan.

11 Q And I think we spoke about -- well, Al

12 Huwaisah, do you recall that study?

13 A I do.

14 Q And do you recall if GIS was involved?

15 A They were. And that was Houston.

16 Q And do you recall the results of that study?

17 A Plans for water flood. So basically

18 revision to Field Development Plan.

19 Q This has been a pretty lengthy list. Do you

20 recall any other studies?

21 A I mentioned one earlier on, that was De

22 Lima, but not in this, in this list because the

23 objectives were somewhat different. It was to just

24 better characterize the rock.

25 Q I see.

0147

1 IAIN PERCIVAL

2 A So it was a study done within AGR.

3 Q And where were the objectives versus the
4 objectives of this, which were to what?

5 A This was -- all these fields had revisions
6 to Field Development Plan done by GIS teams, often
7 with succondees from PDO. The difference here with De
8 Lima was that that was specific rock data measured in
9 Houston. That data was then sent back to PDO, and PDO
10 themselves did whatever they did with the data.

11 Q I see. Do you recall if PDO had RRR
12 targets?

13 A I can't remember specific field targets or
14 company targets.

15 Q Do you recall if they existed for PDO?

16 A I can't remember.

17 Q Do you know what RRR is? 30985

18 A Reserve Replacement Ratio, which is very
19 often not qualified whether it's proved or
20 expectation.

21 Q I see. Do you recall whether or not Shell
22 reported expectation RRR targets?

23 A Reported internally or externally?

24 Q Externally to the analysts you mentioned
25 before.

0148

1 IAIN PERCIVAL

2 A I can't remember.

3 Q Okay. Do you remember an initiative called
4 T-50 --

5 A I do.

6 Q -- within PDO?

7 And that was specific to PDO; is that
8 correct?

9 A That was a PDO, indeed, driven -- in fact a
10 Government-driven, I think, yeah.

11 Q And what was it generally?

12 A It was what can be done to achieve an
13 overall recovery factor of 50 percent, that's average
14 across the whole of the subsurface of Oman. On an
15 individual field basis, it could be more or it could
16 be less.

17 Q And did GIS assist in T-50?

18 A They did.

19 Q And what did GIS do?

20 A That was part of the studies or indeed lease
21 services such as better defining the rock in AGR.

22 Q Were there T-50 teams within GIS?

23 A Not specifically called T-50. T-50 was very
24 much owned by Petroleum Development Oman. It was very
25 much seen as an Oman, Omani thing, and contributions

0149

1 IAIN PERCIVAL

2 from third parties such as ours were important but
3 not, if you like, advertised as outside Oman.

4 Q Do you recall individuals who worked on

5 T-50?

6 A Within GIS, or in general?

7 Q Oh, within GIS.

8 A Well, as I say these fields here would have

9 been contributing to the overall T-50, so a large

10 number of my staff were working at times on any one of

11 these, these projects. So to say which staff member

12 at which time was working which field, I just can't

13 remember that.

14 Q Did GIS screen fields within PDO to -- in

15 connection with T-50?

16 A They were involved in particular EOR,

17 Enhanced Oil Recovery, or Improved Oil Recovery

18 candidates; by definition would then contribute to

19 T-50.

20 Q And do you recall if T-50 was achieved?

21 A As an end goal, we will know when PDO is

22 done. Then you'll know how much you've actually got

23 from your fields.

24 Q I see. Was it -- was T-50 assessed on a

25 yearly basis?

0150

1 IAIN PERCIVAL

2 A The progress towards T-50 is looked at by
3 the PDO management team.

4 Q And they review that yearly?

5 A Yes.

6 Q And during your time at GIS, did they meet
7 T-50?

8 A No. As I said, the -- they would meet the
9 planning milestones, but whether Oman actually
10 achieves an overall recovery factor of 50 percent from
11 its existing resource base will, as I say, only be
12 known when each and every one of the fields has
13 stopped production and they can then say, so what did
14 we actually get? So in 40, or 50 years' times.

15 Q In 40 or 50 years' time that's when the
16 fields will no longer be viable?

17 A It depends on oil price.

18 Q The fields will be tired; is that right?

19 A Yeah. And the oil price will be high, so

20 high oil price tends to make fields less tired.

21 Q Do you recall if GIS did work for SPDC?

22 A Yes, they did.

23 Q And do you recall where that work was done?

24 A That was done exclusively in Rijswijk and in

25 Aberdeen.

0151

1 IAIN PERCIVAL

2 Q And what was the result of that work?

3 A Again, the work was targeted at revising

4 Field Development Plans, doing long-term gas planning.

5 Q Did GIS participate in peer reviews?

6 A On request. And just for clarification,

7 sometimes incorrectly a VAR review is termed a peer

8 review, which I guess you could call it, but the peer

9 reviews that GIS were involved in were more peer

10 reviews of the technology done, the study work done,

11 not if it was fit under the overall governance

12 structure.

13 Q Do you recall specific peer reviews that you

14 were involved in while at GIS?

15 A I can only recall one. There were other

16 ones done, but I can only recall one.

17 Q And which one?

18 A That was Colburn Channel.

19 Q And where was that?

20 A In the Delta of Nigeria, yeah.

21 Q And what was the result of that peer review?

22 A The work is going fine. Keep going.

23 Q And whose work were your reviewing?

24 A A combined GIS and SPDC team.

25 Q And the GIS team was from Rijswijk; is that

0152

1 IAIN PERCIVAL

2 correct?

3 A Yes. The SPDC studies were only done in

4 Rijswijk, and Rijswijk/Aberdeen. We called the access

5 basically Rijswijk.

6 Q Do you know of other peer review conducted

7 by GIS?

8 A There would have been a number as it was

9 part of the process, but which ones at which time, I

10 can't recall.

11 Q Do you recall whether or not GIS did work

12 for Brunei?

13 A I can't recall. I can't recall.

14 Q Do you recall whether or not SEPTAR did work

15 for Brunei?

16 A SEPTAR would have done work for every single

17 Operating Unit under -- because SEPTAR, of course,

18 then covered technology development and so there would

19 have been work done for Brunei as part of the

20 technology development program.

21 Q SEPTAR did work for all the OUs; is that

22 correct?

23 A They developed the technology program, which

24 was contributed to by all of the OUs.

25 Q Do you know of a group within SEPTAR that

1 IAIN PERCIVAL

2 worked on Brunei?

3 A A specific group? No.

4 Q Are you familiar with a field called the
5 Champion field?

6 A I am.

7 Q And did GIS work on the Champion field?

8 A I can't recall.

9 Q How do you know of the Champion field?

10 A From my time working in Brunei.

11 Q Do you know if SEPTAR worked on Champion
12 field?

13 A They did.

14 Q In the way we just discussed?

15 A Champion field was a candidate for a
16 specific sort of horizontal well drilling and the
17 wells entity within SEPTAR worked on that.

18 Q And do you recall the results of that work?

19 A Yes. Som very successful wells were
20 drilled.

21 Q Did it result in a Field Development Plan?

22 A No, the -- it was actually proving

23 technology, different types of horizontal well. I

24 won't go into all the details. And they were field-

25 trialed in Brunei, and successfully.

0154

1 IAIN PERCIVAL

2 Q Did that team quantify reserves?

3 A No.

4 Q Now, in 2003 your title changed; is that

5 correct?

6 A Yes, 2003 was when I moved jobs, yeah.

7 Q And you became -- what was the name of your

8 title?

9 A Global Leader - Hydrocarbon Maturation.

10 Q And were you on the Global Hydrocarbon

11 Maturation Team?

12 A I was a member of that team, yes.

13 Q Were you a leader of that team?

14 A Yes.

15 Q Were there other people who led that team?

16 A Who were on the leadership team. No, I led
17 the team, but I worked with colleagues who were on the
18 leadership team.

19 Q Were there colleagues on your same level?

20 A Yeah. It was a sort of peer group, and
21 there was a premanser paris.

22 Q And were there people who reported to you?

23 A On the team? No.

24 Q Do you recall how many peers there were on
25 this team?

0155

1 IAIN PERCIVAL

2 A Five, six -- seven.

3 Q Was Mr. Darley on this team?

4 A No, no. Mr. Darley was several floors above
5 me, yeah.

6 Q I see. You report up to Mr. Darley?

7 A Yeah.

8 Q Who else was on the team with you?

9 A The team was composed of the -- let me step.

10 Back by that time we had -- Shell had the new

11 operating model, as it was called, so there was a

12 regional organization, like a Europe, America, Far

13 East, et cetera, and there was a development manager,

14 or an equivalent title for each of the regions. They

15 were my colleagues on the leadership team, plus one

16 gentleman from EP Solutions, the new entity that was

17 created, plus one representative from the Shared Earth

18 Model Team.

19 Q Do you recall who was from the Shared Earth

20 Model Team?

21 A It changed.

22 Q I see.

23 A We tried to keep continuity with Fred, Fred

24 Hoffman, but often he couldn't make it.

25 Q I see. And what was the purpose of this

0156

2 team?

3 A Again, the -- as I say, the company and EP
4 had reorganized and we had this technology entity
5 called STEP in the center. We had the regional units;
6 Europe, America, Far East, Middle East, Africa. And
7 so the, the main job of this team was to basically
8 build, if you like, a leadership cohesion around what
9 was being done in terms of petroleum engineering,
10 essentially processes and practices, around this new
11 entity.

12 Q And did that have something to do with
13 maturing reserves?

14 A It had a lot to do with maturing volumes; so
15 looking at how much scope was there, how much
16 expectation was there, how much proved reserve was
17 there.

18 Q And was the purpose of this team to
19 facilitate moving reserves from expectation to proved?

20 A It was much more to do with moving volumes
21 from scope category to expectation. And it was very
22 much focused on, so what are you doing in Europe,

23 Aberdeen; what are you doing in America, Houston; what

24 are you doing in Miri, Far East? That's interesting.

25 So is everyone doing the same thing? No. Maybe we

0157

1 IAIN PERCIVAL

2 should adopt that as a practice.

3 It was -- the team was set up to really try

4 and find out what was working, what wasn't working,

5 and to make sure that these ways of working and

6 lessons learned were actually shared on a global

7 basis.

8 Q And during your time on the maturation team,

9 did you review all the OUs?

10 A What do you mean by review?

11 Q It's seems -- and maybe I'm incorrect --

12 that part of the maturation team's purpose was to look

13 at best practices amongst the OUs; is that -- my

14 understanding correct?

15 A That's true, yes.

16 Q And how many OUs did you review to ascertain

17 what their practice was?

18 A I conducted what was called a health check.

19 So basically the state of the capability in each of

20 the regions, at a regional level, but not at an OU

21 level. So I would visit Aberdeen and go through the

22 portfolio; same with Houston, et cetera, et cetera.

23 Q So you went through Houston's portfolio, you

24 went through Rijswijk's portfolio; is that correct?

25 A Rijswijk didn't have a portfolio. Whatever

0158

1 IAIN PERCIVAL

2 Rijswijk had to do had, of course, been given to them

3 by the OU.

4 Q I see. Where an OU was based, that's where

5 the portfolio was based?

6 A Well, it's where the region was

7 headquartered. There are several Operating Units in a

8 region.

9 Q Uh-huh. What are the regions, then?

10 A At that time we had Europe, Americas, Middle

11 East -- which then included Russia -- Far East, and

12 Africa.

13 Q And what region was Oman part of, then?

14 A Part of the Middle East.

15 Q And what part of Vene -- what part -- what

16 region -- strike that.

17 What region was Venezuela part of?

18 A Americas.

19 MR. BIGIN: Let's go off the record for a

20 couple of minutes, okay?

21 VIDEOGRAPHER: We are going off the record.

22 The time is 4:05 p.m.

23 (Break taken.)

24 VIDEOGRAPHER: Here begins Volume 1,

25 Videotape No. 3 in the deposition of Iain Percival.

0159

1 IAIN PERCIVAL

2 We are back on the record. The time is 4:21 p.m.

3 BY MR. BIGIN:

4 Q Mr. Percival, before we went on break I
5 believe that you testified to the effect that SEPTAR
6 did some work on Brunei. Do you recall that?

7 A Yes.

8 Q And is that -- is that correct?

9 A As I said, in the wells domain, yeah.

10 Q And do you recall where that work was done?

11 A Essentially, to my recollection, in
12 Rijswijk.

13 Q And do you recall the results of that work?

14 A As I said, the drilling of, I think it was
15 two very successful technology horizontal wiggly
16 wells, yeah.

17 MR. BEGIN: Let's mark our next Exhibit No.
18 No. 7.

19 (Exhibit No. 7 was marked for identification and
20 was attached to the transcript.)

21 BY MR. BEGIN:

22 Q And for the record this is Exhibit No. 7,
23 Document No. 000103804007. It's an E-mail from Mr.
24 Percival sent 11/30/2003.

25 Can you take a couple of minutes to review

0160

1 IAIN PERCIVAL

2 this E-mail?

3 A Uh-huh.

4 (Reviewing.)

5 Yep. Okay.

6 Q Okay. Did you write this E-mail?

7 A I did.

8 Q In the third sentence you wrote, I was

9 ejected from my last enjoyable job by Karel as a

10 matter of fact because I refused to endorse the hype

11 from the USA on how all things done by Shell Deepwater

12 Services are the ultimate in perfection.

13 Do you remember writing that?

14 A I do.

15 Q And do you remember why you wrote that?

16 A Because I had a view on how things were done

17 in Shell Deepwater Services vis-a-vis how things were

18 done in GIS.

19 Q And what was that view?

20 A The view was that we were somewhat more

21 humble in GIS in contrary to our colleagues in SDS.

22 Q And what do you mean by humble?

23 A Well, I think everybody knows the word

24 humility, humble.

25 Q What things being done are you referring to?

0161

1 IAIN PERCIVAL

2 A The -- it was all around the, if you like,

3 the process, the way that work was done. The

4 operational model that was used in GIS was one of we

5 like listening and working with the client, the

6 customer, and in SDS there was somewhat more of a tell

7 than a listen.

8 Q And what was the hype from the USA?

9 A Well, let's get clear that I don't mean the

10 entire nation of the United States of America. I have

11 some very good friends in America. And it was indeed

12 from the SDS operations which was wholly based in

13 Houston. There was no SDS presence in Rijswijk.

14 Q And so what was their hype?

15 A Everything is great. Everything is perfect.

16 Q And why did you refuse to endorse that hype?

17 A Because I believe that every single one of

18 us, especially in a technical professional job, have

19 an opportunity, and in fact an obligation, to listen

20 and learn.

21 Q And in that context, listening, learning

22 from the client; is that what you meant?

23 A From colleagues within, within Shell. I had

24 just gone through the period which we discussed

25 earlier on of aligning SDS with GIS to become EP

0162

1 IAIN PERCIVAL

2 Solutions, and it had been a difficult time bringing

3 to the table the good things which I believed had been

4 developed in terms of the way of doing work and a

5 process within GIS and how I believed that the new

6 entity called EP Solutions, which was indeed the
7 amalgamation of the two, could well take on these
8 processes and these ways of doing things, and it was,
9 shall I say, difficult to get a hearing.

10 Q Were these process -- did these processes
11 include Field Development -- development of Field
12 Development Plans?

13 A The making of Field Development Plans?

14 Q Yes.

15 A That was one of them, yes.

16 Q And what did you disagree with the U.S.
17 approach versus the GIS approach?

18 A The use of technology, being open to
19 alternative technologies.

20 Q And what does that mean?

21 A I believed that the tool kit which was being
22 deployed within GIS was probably better from the tool
23 kit being deployed by SDS, and it was a view I held
24 and held strongly, and found I was not getting quite
25 the listening that I should have got. I was a

1 IAIN PERCIVAL

2 petroleum engineer talking with two explorers, and it
3 was just a difficult discussion.

4 Q Was there a compromise reached between the
5 U.S. and GIS?

6 A Well, the new entity was put in place called
7 EP Solutions which went live in, I think it was
8 September or October of 2003, if I recall. And in
9 fact, then the majority of the tools which were
10 being -- which had been used by GIS actually then were
11 taken on and used within EP Solutions, in fact driven
12 through the CATTS organization which was the job that
13 I'd actually applied for.

14 Q Okay.

15 A So you can say that my fears were maybe
16 somewhat unfounded.

17 Q So do you disagree that Shell Deepwater
18 Services are the ultimate in perfection?

19 A None of us are the ultimate in perfection.

20 Q Your next sentence you say, we are -- you

21 wrote, we are suffering major problems in the GOM as a
22 result of their colleagues' hype, and it will not be
23 long before the world realizes that the great flagship
24 project Bonga is similar. What did you mean by that
25 sentence?

0164

1 IAIN PERCIVAL

2 A That relates to, indeed, the use of
3 technology, in particular the reservoir modeling tools
4 that were being used.

5 Q And was there a problem with the reservoir
6 modeling tools that were being used?

7 A The modeling tools were absolutely totally
8 appropriate for, if you like, coming up with oil in
9 place estimations and working out the distribution of
10 hydrocarbon. They were not totally suitable from my
11 perspective in terms of managing the water flood which
12 indeed was Bonga from the word go. Bonga would be a
13 water flood project from Day One.

14 Q Was there a change in tools that was

15 employed at Bonga?

16 A Absolutely.

17 Q And when did that change occur?

18 A That change occurred in the course of 2004,

19 so well in advance of Bonga being brought on

20 production. And I'm happy to report that I was proven

21 wrong, and indeed Bonga is a success.

22 Q How were you ejected from your last job?

23 A As I mentioned we had the bringing together

24 of GIS and SDS to make Solutions. I had been the,

25 indeed the leader of GIS, a job that I thoroughly

0165

1 IAIN PERCIVAL

2 enjoyed. It was a very rewarding job. Had, as you

3 noted, applied for the job of the CATTS leader, the

4 Capability and Technology Team, and did not get it, so

5 of course there was an element of frustration. And at

6 the time of writing there was a little bit of

7 uncertainty around what the new job I was in would

8 actually work out to be.

9 Q In the second paragraph, your first sentence
10 states, since my ejection I have been employed as
11 so-called Global Leader - Hydrocarbon Maturation to
12 magic out of nowhere lots of bbls of oil to improve
13 our miserable RRR and to do something about the
14 miserable state of hydrocarbon accumulation
15 development planning.

16 Can you tell me what that sentence means?

17 A Yes. There was a, a goal given to the head
18 of Global Hydrocarbons Maturation Planning, which
19 indeed was the job I came into, which basically stated
20 that the group of four of us in The Hague would book a
21 hundred million barrels of oil. And my discussion
22 indeed with John Darley at the time was, I have no oil
23 field, so I cannot book any oil. It's not possible.
24 Oil is booked by an Operating Unit, by a company, like
25 PDO, like SPDC, like Shell Expro. I cannot do this.

1 IAIN PERCIVAL 31009

2 It's just not possible.

3 And in fact after a lot of discussion, that

4 particular target was taken away, and it was realized

5 that it was a target that made no sense to someone

6 sitting behind a computer in Rijswijk. But at the

7 time, and this was still an ongoing debate, and again

8 it was an expression of frustration that this was

9 there and I could not get it off the table. It in

10 fact came off the table about -- this was dated in

11 November, so by January it had gone away and it was

12 not held as a target.

13 Q Are you familiar with the term safeguarding

14 reserves?

15 A I've heard the term being used.

16 Q Is that something that -- well, do you know

17 what it means?

18 A Well, I know what my take on it is.

19 Q Okay. Can you please give me your take on

20 it?

21 A Yes. It's basically ensuring that the, the

22 practices are being, are being applied, the people are

23 being applied to make sure that indeed nothing happens
24 that could actually negatively impact on reserves.
25 It's as simple as that.

0167

1 IAIN PERCIVAL

2 Q Do you know if GIS was involved in
3 safeguarding reserves?

4 A If you go back to the list of fields,
5 indeed, which we were working on in Oman, the revision
6 of Field Development Plans, they're looking at the
7 potential from water flooding or from gas injection
8 indeed was part and parcel of making sure that you
9 underpinned estimates, that you underpinned forecasts.

10 Q And was GIS technology used to safeguard
11 reserves?

12 A Well, GIS technology -- I don't actually
13 understand the expression. Basically GIS had
14 capability, basically people thinking and working, and
15 indeed through the fields that we talked about and

16 others, and indeed an examination of the reservoir

17 management techniques, et cetera, was done and as a

18 part of that, you then make sure that the practices

19 that should be applied are being applied.

20 Q As part of the maturation team, did you

21 oversee -- not oversee -- strike that.

22 As part of the maturation team, did you

23 review GIS's safeguarding of reserves?

24 MR. CLARK: Objection. Vagueness.

25 Q Review whether -- withdraw that.

0168

1 IAIN PERCIVAL

2 As part of the maturation team, did you come

3 to know whether GIS safeguarded reserves?

4 A Well, when I was a member of the -- or led

5 the maturation team, GIS no longer existed.

6 Q I see. The new entity.

7 A The new entity, EP Solutions.

8 Q Uh-huh.

9 A As part of the health check process which I

10 think I mentioned earlier on, indeed EP Solutions was
11 also given a health check to ensure that the processes
12 that they were using, the capability they had on their
13 staff was appropriate indeed to the work that they
14 wanted to do. So that was indeed, if you like, making
15 sure through the vehicle of the matur -- hydrocarbon
16 maturation team that the appropriate approaches were
17 being taken to work.

18 Q Was one of those approaches making sure that
19 there were enough man-years being devoted to these
20 projects?

21 A Indeed it was making sure that there was an
22 alignment between objectives and manpower in the
23 context of manpower planning was one of the jobs which
24 the maturation team evolved and took on board, so we
25 started setting priorities in terms of you need X

0169

1 IAIN PERCIVAL

2 people of a certain type there and Y there.

3 Q Can you tell me what man-years are

4 A It's essentially a year's worth of work of
5 one person.

6 Q And do you recall if additional man-years
7 for projects were needed at PDO?

8 A By the time that the Global Maturation Team
9 was in place, PDO had themselves put in place the --
10 their own study center, a first-class study center in
11 fact of a couple of hundred people. So, if you like,
12 the goal post as it were had shifted, so the
13 experience that we were building up in the early part
14 of GIS, say 2000, 2001, 2002, that model actually had
15 to be put away because there was now this new very
16 capable study center which had been put together in
17 Muscat, which indeed took over a large amount of the
18 work which had been done by GIS. That was the whole
19 point of doing work in-country.

20 Q Do you recall when you -- strike that.

21 When you wrote to magic out of nowhere lots
22 of bbls, did someone ask you to do that?

23 A That was related specifically to this target
24 of a hundred million barrels. I said I have no oil

25 fields, so where does this come from?

0170

1 IAIN PERCIVAL

2 Q And Mr. Darley was part of the group that
3 asked you to meet that target?

4 A That target had been actually evolved indeed
5 by Mr. Darley and Mr. Bell and Mr. Ward, the three I
6 mentioned.

7 As I said I discussed this further with John
8 on several occasions, and then by the time that the
9 appraisal review was taking place in January, that
10 target had been -- it had been accepted this was not a
11 valid target to give to someone sitting in Rijswijk.
12 It went away. It was just taken off the table.

13 Q Did that target go to some other group who
14 was more appropriate?

15 A The target itself, no. But as I said
16 earlier on, all of the Operating Units have their own
17 particular aspirations in terms of replacing reserves,

18 so indeed that's what they did. And we ~~didn't~~ ^{didn't}

19 Hydrocarbon Maturation did whatever we could to help

20 them. But we could not book either in the new entity

21 of Technology Basilar (phonetic) Excellence or indeed

22 in GIS, could not book reserves. It just wasn't.

23 It's not part of the rules. You can't do that.

24 Q Do you have an understanding of why that

25 target was set?

0171

1 IAIN PERCIVAL

2 A It was -- no, because it was set before I, I

3 was approached to take the job, and I said I would

4 take the job on the condition that this target was

5 taken away.

6 Q And when did they take that target away?

7 A As I said it was the result of quite a lot

8 of discussion, but by the time my appraisal was

9 conducted in January of 2004, it had gone.

10 Q Do you recall a project called Rockford?

11 A Yes, I do.

12 Q And were you involved in that project?

13 A I was involved when I could be involved. I

14 could not be involved full-time. Again, John was very

15 busy with this project and he asked me to be involved

16 when I was actually in town.

17 Q John who?

18 A John Darley. Sorry.

19 Q Were there specific segments of the project

20 that you were involved in?

21 A No, it was basically when you're involved,

22 help out. When -- sorry, when you're available, help

23 out. And so it was not, if you like, an organized

24 Iain, be involved in this field, this field, this

25 field. No, it was, I'm available these two weeks, so

0172

1 IAIN PERCIVAL

2 what's going on?

3 Q Did you have particular expertise with PDO

4 for example?

5 A No, in fact I wasn't deployed in any

6 particular region or focused in any particular region.

7 What my job was was to sit with John in The Hague and

8 indeed look at the reports coming back in from, if you

9 like, the field and take a view on what we were seeing

10 and collect lessons learned.

11 Q Was there a recategorization as a result of

12 Project Rockford?

13 A That was the other way around. Rockford

14 took place after recategorization, as I recall, unless

15 my memory is --

16 Q When was the recategorization that you

17 recall?

18 A The actual announcement was 9th of

19 January 2004, I think.

20 Q Okay.

21 A And I was involved post the recategorization

22 announcement, not before.

23 Q When you testified earlier that you were

24 involved in Rockford for specific projects, was that

25 post January 9th, 2004?

0173

1 IAIN PERCIVAL

2 A Yeah. I got involved post 2004. What
3 happened before 2004, I don't know. And in fact I may
4 be confusing with Rockford with Bajer field review
5 because I was involved indeed with what was post-
6 recategorization work with the external consultants,
7 et cetera. I'm sorry if I'm confusing, but I may be
8 getting the terminology mixed up.

9 Q So did the maturation team do work that
10 related to the recategorization in 2004?

11 A Absolutely not.

12 Q I believe you mentioned that you had contact
13 with external -- maybe you trailed off a little --
14 external consultants; is that correct?

15 A Well, I was referring to Ryder Scott who
16 were brought in post the recategorization to start
17 going through the major fields review.

18 Q And you worked with Ryder Scott when you did
19 this field review?

0173

1 IAIN PERCIVAL

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3 happened before 2004, I don't know. And in fact I may
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13 with external -- maybe you trailed off a little --
14 external consultants; is that correct?

15 A Well, I was referring to Ryder Scott who
16 were brought in post the recategorization to start
17 going through the major fields review.

18 Q And you worked with Ryder Scott when you did
19 this field review?

20 A Yeah, off and on. Always in The Hague. I

21 never did any actual field visits or OU visits.

22 Q Any other external consultants?

23 A No. The only other one I came in touch with

24 was Mr. Ross who indeed was part and parcel of

25 developing the training, the reserves training package

0174

1 IAIN PERCIVAL

2 which myself and several others were involved in

3 developing in the course of 2004.

4 Q Were you aware of additional announcements

5 regarding recategorizations after 1/9/04?

6 A I can't remember how many there were, but

7 there were a number of announcements made by Malcolm

8 Prindett (phonetic), et al, yeah.

9 Q And was your work in 2004 used for those

10 recategorizations?

11 A Well, the work that was being done by the

12 major field review team was input to, as things panned

13 out through 2004, and as I said a few minutes ago, I

14 indeed was involved with John doing, if you like, ad
15 hoc from my point of view assistance when I was
16 actually in town. At the time I was also trying to
17 embed this new organization of hydrocarbon maturation
18 so I was actually going around to the OUs talking
19 about what our aspirations, et cetera, were, and we
20 did not want that to stop. Important although the
21 major field review work was, John said, no, let's keep
22 your work ongoing, and I will only use you when you're
23 back in Rijswijk.

24 Q While you were on the maturation team did
25 you have contact with Shell's accountants?

0175

1 IAIN PERCIVAL

2 A The accountants themselves -- the external
3 accountants?

4 Q Correct.

5 A No, I did not.

6 Q Did anyone on your team?

7 A Which team? The --

8 Q The maturation team.

9 A I can't say yes or no to that because the

10 teams of course sat, the team members sat in Aberdeen,

11 in Houston, et cetera, so I have no idea if they were

12 actually, locally actually having to be involved in

13 discussions with the accountants. I just can't tell.

14 Q And while you were at GIS did you have

15 contact with the external accountants?

16 A No.

17 Q Were you a Development Manager in Brunei

18 from around 19 -- from '94 to '97? Do those dates

19 sound correct?

20 A Yeah, I was there from '95 to the end of

21 '98, yeah.

22 Q And what does a Development Manager do?

23 A In Brunei, then, the Development Manager was

24 in charge of development of staff, in charge of coming

25 up with development plans to take discoveries to the

1 IAIN PERCIVAL

2 next phase, redevelopment plans, and also a member of
3 the management team.

4 Q Was one of the responsibilities also signing
5 off on proved reserves?

6 A The entire ARPR, the Annual Review of
7 Petroleum Resources contributions from Brunei fell
8 under my remit, yeah.

9 Q Do you recall if, if reserves signed off
10 while you were at Brunei were recategorized in any
11 way?

12 A Again, I can't remember the details, but
13 there was a recategorization also in Brunei, and I had
14 signed off beforehand, so by definition, yes.

15 Q And did anyone consult you about the booking
16 of those reserves?

17 A No.

18 Q Were you interviewed by anyone regarding the
19 booking of those reserves?

20 A I was not, no.

21 MR. BIGIN: Let's go off the record for five

22 minutes. Wrap it up.

23 VIDEOGRAPHER: We are going off the record.

24 The time is 4:48 p.m.

25 (Break taken.)

0177

1 IAIN PERCIVAL

2 VIDEOGRAPHER: We are back on the record.

3 The time is 4:56 p.m.

4 BY MR. BIGIN:

5 Q Okay. Do you have an understanding of why

6 reserves in Brunei were recategorized?

7 A No, I don't.

8 Q Do you know Mr. Philip Watts?

9 A Do I know him? I know who he is, but I

10 don't know him like as a friend.

11 Q Did you have conversations with Mr. Watts in

12 2003?

13 A I did.

14 Q Do you recall the substance of those

15 conversations?

16 A It was around diversity.

17 Q And what was diversity again?

18 A Well, it was this, this thrust, as I think

19 we mentioned earlier on, in terms of doing more about

20 gender representation in the work force, and I think,

21 as I mentioned, had one of my tasks and targets to

22 lead the STEP diversity team. So I talked with him on

23 one occasion about diversity.

24 Q Anything else?

25 A No.

0178

1 IAIN PERCIVAL

2 Q Any other occasions?

3 A I've seen him at conferences and stuff. But

4 you're specific with 2003?

5 Q That's correct.

6 A Yeah, I can't remember any other

7 conversation apart from this diversity meeting.

8 Q Okay.

9 MR. BIGIN: I have no further questions.

10 Thank you.

11 MR. CLARK: I have just one area of inquiry.

12 EXAMINATION BY COUNSEL FOR THE SHELL CORPORATE

13 DEFENDANTS AND THE WITNESS

14 BY MR. CLARK:

15 Q A few moments ago you were asked about

16 reserves in Brunei; is that correct?

17 A That's correct.

18 Q Do you know the first year you were

19 responsible for a sign-off on the ARPR for Brunei?

20 A The -- it would have been -- I arrived in

21 1995, so the first year I would have been responsible

22 for was 1996.

23 Q And do you know the last year you were

24 responsible for sign-off on the ARPR for Brunei?

25 A Yeah. I left in November of '98, so the

0179

1 IAIN PERCIVAL

2 last full year I was responsible for was the bookings

3 for 1997.

4 Q Do you have any idea what year the reserves
5 that were debooked for Brunei in 2004 were originally
6 booked in?

7 A No, I don't know.

8 Q So do you have any idea whether those
9 reserves were reserves included in an ARPR which you
10 signed off on?

11 A I don't know.

12 MR. CLARK: Thank you.

13 No further questions.

14 MR. BIGIN: Nothing else.

15 VIDEOGRAPHER: This marks the end of Volume
16 1, Videotape No. 3 in the deposition of Iain Percival.

17 We are going off the record. The time is 4:58 p.m.

18 (Signature having not been waived, the
19 examination of Iain Percival was concluded at
20 4:58 p.m.)

21

22

23

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0180

1 IAIN PERCIVAL

2 ACKNOWLEDGMENT OF DEPONENT

3 I, Iain Percival, do hereby acknowledge that I
4 have read and examined the foregoing testimony, and
5 the same is a true, correct and complete transcription
6 of the testimony given by me, and any corrections
7 appear on the attached Errata sheet signed by me.

8

9

10 _____

11 (DATE) (SIGNATURE)

12

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0181

1 IAIN PERCIVAL

2 CERTIFICATE OF NOTARY PUBLIC

3 I, Anthony Delaglio, Notary Public, the

4 officer before whom Iain Percival appeared, do hereby

5 certify that the foregoing witness personally appeared

6 before me and was duly sworn by me.

7 IN WITNESS WHEREOF, I have hereunto set my

8 hand and affixed my notarial seal this 9th day of

9 February 2007.

10 My Commission Expires: October 14, 2010

11

12

13 _____

14 NOTARY PUBLIC IN AND FOR

15 THE DISTRICT OF COLUMBIA

16

17

18

19

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21

22

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24

25

0182

1 IAIN PERCIVAL

2 CERTIFICATE OF SHORTHAND REPORTER

3 I, Dawn M. Hart, Registered Professional

4 Reporter, the officer before whom the foregoing

5 proceedings were taken, do hereby certify that the
6 foregoing transcript is a true and correct record of
7 the proceedings; that said proceedings were taken by
8 me stenographically and thereafter reduced to
9 typewriting under my supervision; and that I am
10 neither counsel for, related to, nor employed by any
11 of the parties to this case and have no interest,
12 financial or otherwise, in its outcome.

13

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21 Court Reporter

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23

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0183

1 IAIN PERCIVAL

2 E R R A T A S H E E T

3 IN RE: Royal Dutch/Shell Transport Securities

4 PAGE LINE CORRECTION AND REASON

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23 (Date) (Signature)
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0184

1 IAIN PERCIVAL
2 E R R A T A S H E E T
3 IN RE: Royal Dutch/Shell Transport Securities
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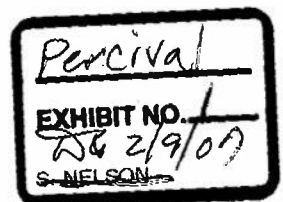
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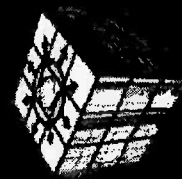
From: Giles, M.R.
To: HOFFMAN, FRED F.J. /SEPCO /- /517169; Percival, Iain
I.D.R. /SIEP /EPT-AG
CC:
BCC:
Sent Date: 1999-10-28 20:24:39.000
Received Date: 1999-10-28 20:24:46.000
Subject: Vu-graphs for Monday
Attachments: Iains_Talks.ppt , Freds_No_images.ppt , Strategy_Backups.ppt

Gentlemen,
FYI attached are the near finished vu-graphs for Monday. These now cover three talks, Iain's original introductory talk, the replacement to the Huisinga talk to be given by Iain, and Fred's strategy talk. I will make a print run tomorrow, but we should also be able to make changes right up to the post. Note that I've removed some images from Fred's talk from the staircase and shared earth model slide, this is only to make them e-mailable, and the images will be there Monday. Feel free to e-mail any changes to me.

regards,
Melvyn

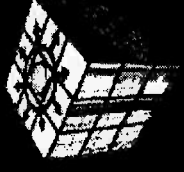
Dr. Melvyn Giles
Shared Earth Model Cluster Leadership Team
Phone: ++ 31 70 311 2901





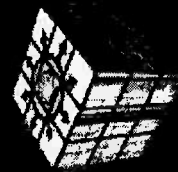
Subsurface 2000 Programme into the Next Millennium

Subsurface BAA workshop
November, 1999



Workshop Objectives

- Agree collaborative development of 2000+ evolutionary programme
- Agree performance measures of BAA's
- Establish content and probable call on Technical Services in 2000

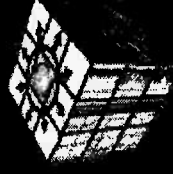


Workshop HSE Issues

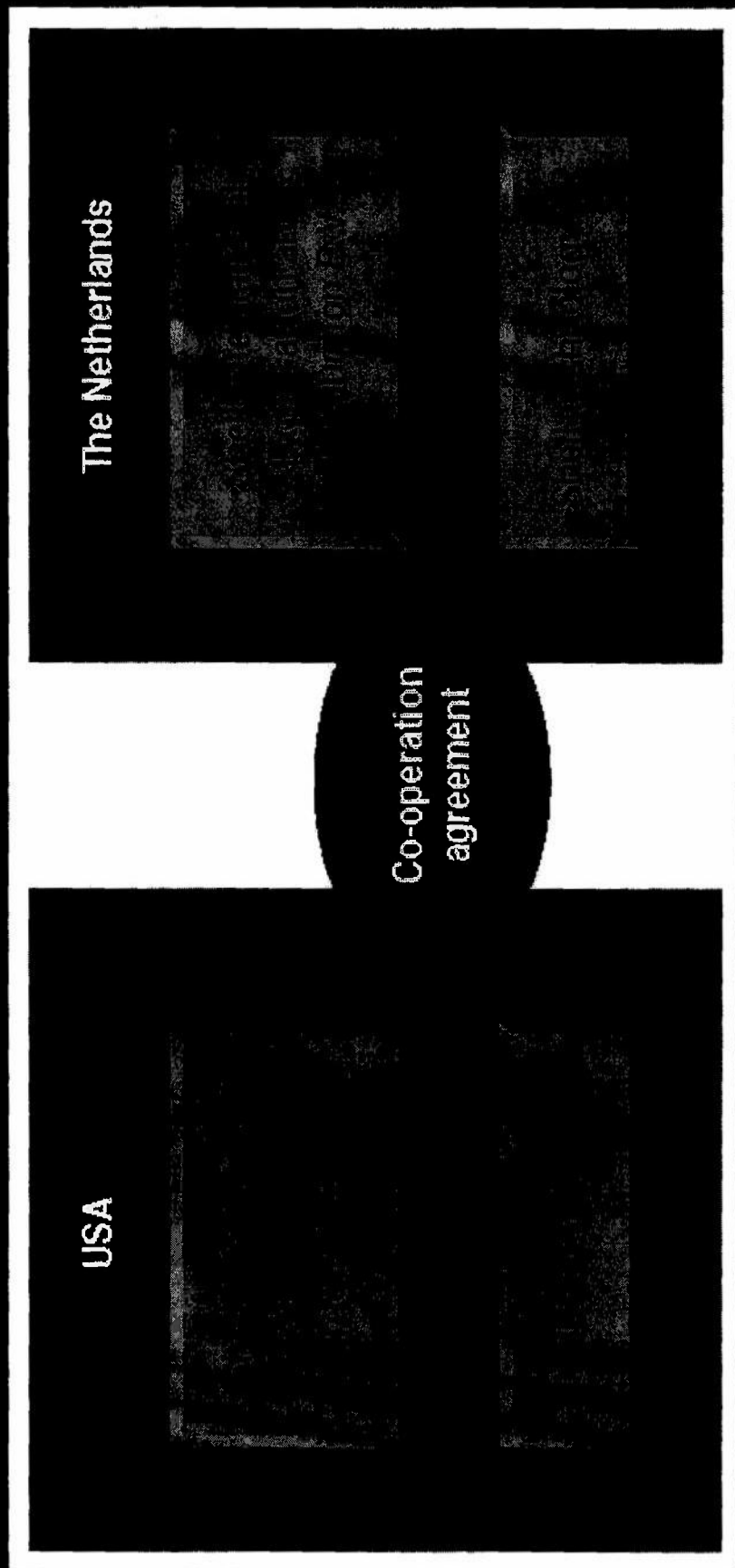
- <Raymond Insert>

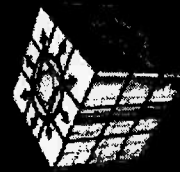
Globalisation of EP Technology

- Before July 1 two technology development sites:
 - Shell EP Research & Technical Services (Rijswijk) working for Royal Dutch/Shell Group OUs
 - Shell EP Technology Co (Houston) working for Shell Oil Co BUs and other OUs
- Two overlapping but distinct R&D programs
- Since July 1, 1999 one global technology provider
- Serves one global customer base



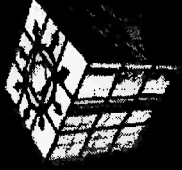
STEP: One Global Technology Organisation





What does this mean for us?

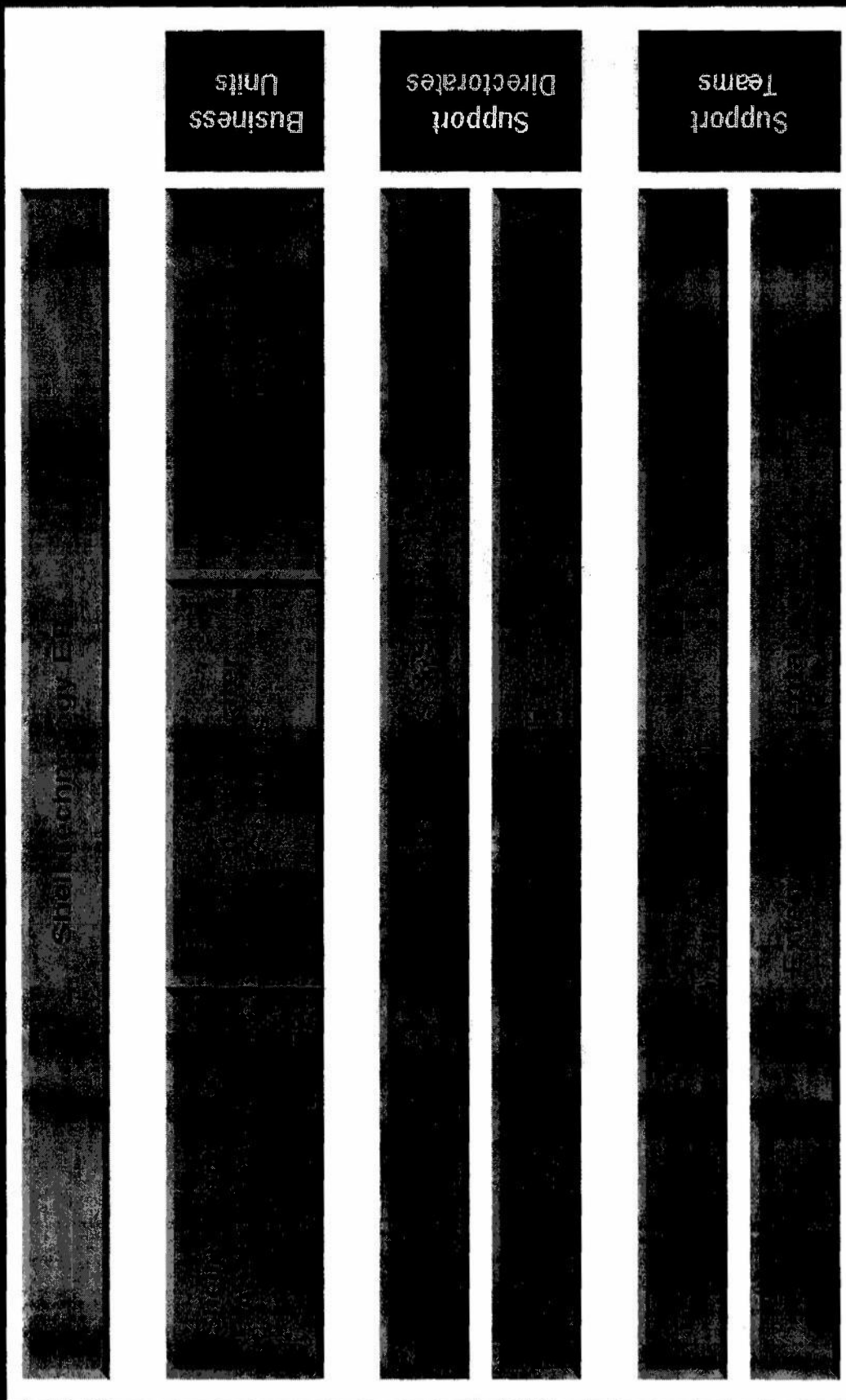
- Two sites - one management
- Global teams - have to learn how to work virtually
- Merging of two R&D programs
- Portfolio rationalisation
- Aligning of cultures
- Single customer base



What will it mean for you?

- Broader range of products and services
- More and more diverse skills
- Better time zone coverage
- There will be a transition period

Shell Technology Organisation



SEPTAR Clusters

Shared Earth Model

Geophysical Development
Reservoir Architecture
Rock & Fluid Properties
Reservoir Optimisation
Structural Geology
Hydrocarbon Modelling

Geosciences & Integrated Services

Geophysical Advice & Geomatics
Shell Geophysical Services
Geochemical & Core Analysis Services
Integrated Basin & Field Studies
Reservoir Engineering Support

Novel Technologies

Modelling and Inversion
Reservoir Modelling Tools
Heavy Oil Technologies

Surface

Wells

Business Interface Management

Value Assurance Services



SEM Cluster Teams & Sponsors



Fred Hoffman



John Bickley

Deputy BAAC BEAM



Chris Coiroan

Deputy BAAC SSI



Michael Diederix

Petrophysical skills for
SEPTAR

Deputy BAAC SRM



John Gidley

Geology Skills for SEPTAR



Mellynn Giles

BAAC BEAM
Global Subsurface CIN



Ad van der Schueren

Geophysical skills for
SEPTAR
BAAC SSI



Tom Schulte

BAAC DRO

TSP



Mark Shannon

TSP



Herb Yuan

BAAC SRM

GC



Simplify to CLT and responsibilities.....

Geosciences & Integrated Services

Iain Percival

Lyle Henderson

Alan Kornacker

Jim Thomas

Deputy BAAC DRO

Software deployment

Pieter Ruijterbunt

Jerry Lanthier de Langlade

TSP

Richard Waterland

Adam Lomas

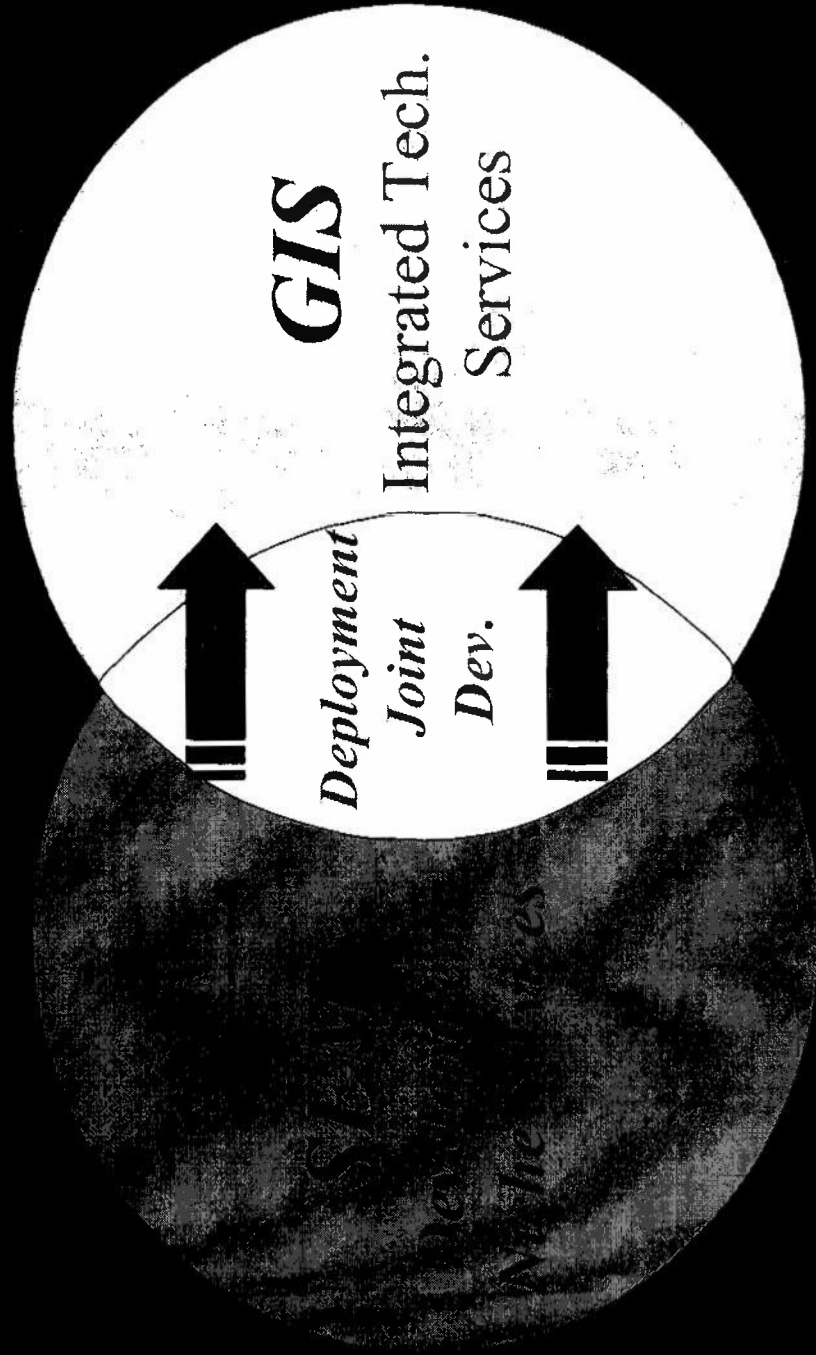
Software portfolio Management



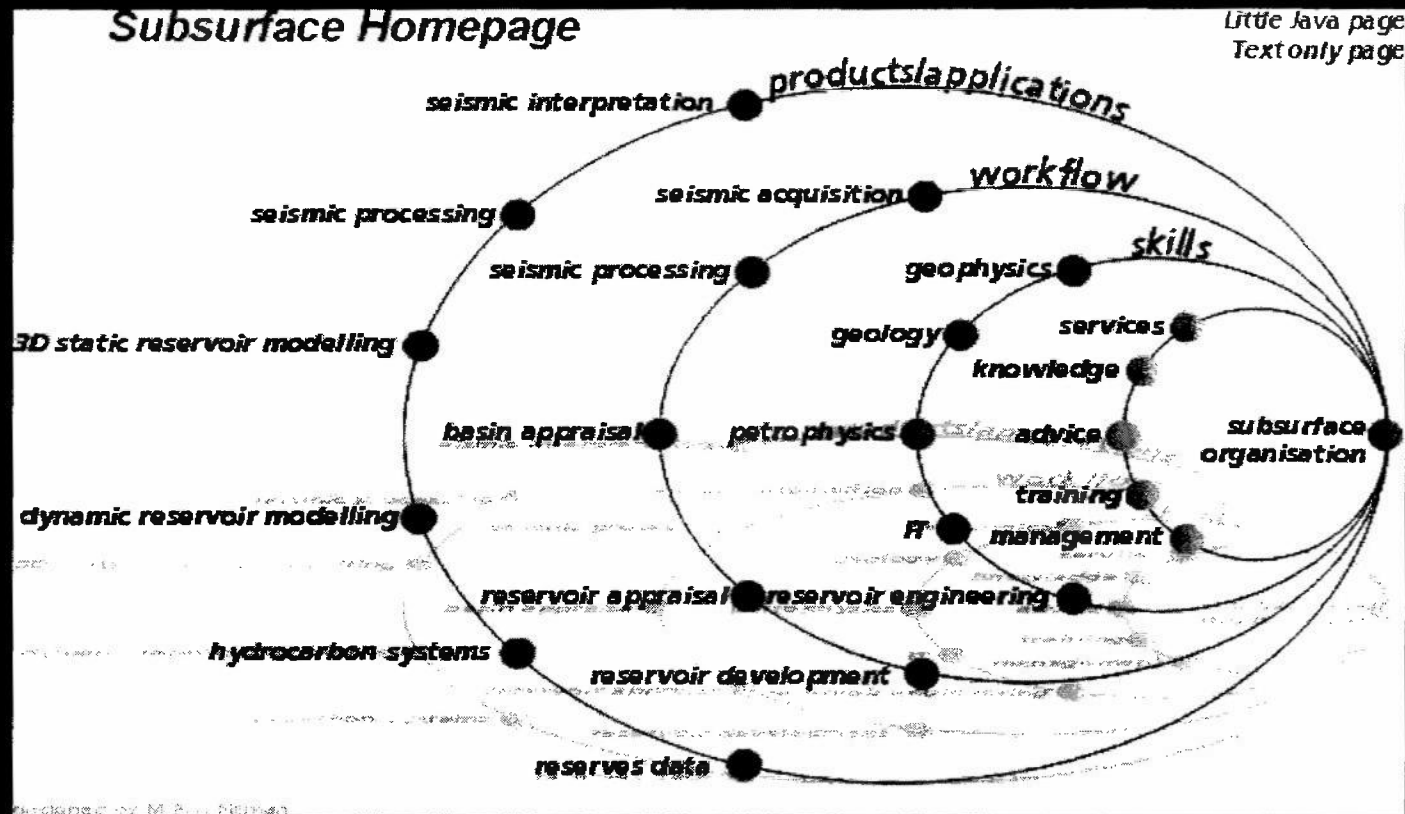
SEM & GIS

Working as one subsurface technology

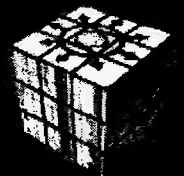
provider....



Our WEB homepage



Visit our WEB site at:
<http://swwrij.siep.shell.com/subsurface>



Customer Intimacy

- Know your customers
 - The subsurface strategy requires knowing the customer so well that our relationship creates technology in partnership with our OUs which is competitively superior and adds the maximum value to our customers.
- We will achieve this by:
 - Structured relationships between customers and CLT members, coordinated workshops and technology team visits as well as customer visits to SEPTAR.
- This will be achieved when:
 - SEPTAR and you share the problems and solutions



Elements of an Integrated Business Strategy

Business Steers

Technology Drivers

An Integrated Strategy Addresses

HR & Skills

Management

Investment Strategy

External Relationships

Strategic Cost Leadership

Technology

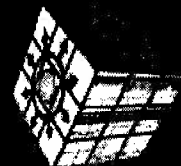
Implementation

Integration Strategy

Shared External Markets

Competitive Intelligence

Innovation & Portfolio Renewal



Advisers

Subsurface Portfolio

Technology
Products, and
Services, and
Applications

Relationships

- Internal
- External

Technology Products

- Eliminate Duplication
- Manage maturing technologies
- Integrated toolkit

Relationships

- Build true customer intimacy
- Develop external relationships

Core Competencies

- Maintain critical skills
- Augment with commercial skills



Subsurface Global Knowledge, Information Skills Network

<http://swvl.epglobal.shell.com/forums/subsurface/dispatch.cgi>

Value \$mm

1000's

100's

10's

1's

Break-Through

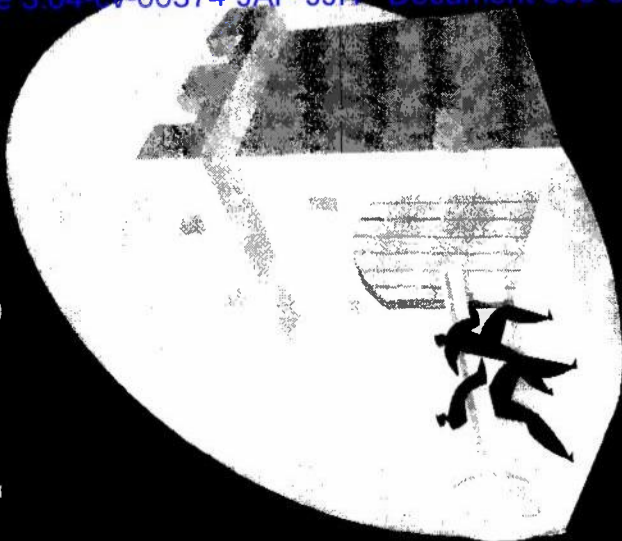
Rapid Exploitation
of New Technology
Improved Business Decision

Best Practices &
Knowledge Sharing

Contracts, Procurement & C. I.

Problem Solving

Challenges



Unlocking value
by sharing



Technology Implementation

- Technology is valueless unless implemented and exploited
 - OU lead implementers need to be identified at this workshop
 - SEPTAR can facilitate implementation but cannot ensure that it is exploited
 - Technology is best implemented as part of an integrated OU business strategy



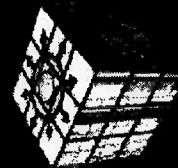
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Approved 2000 Program
Non-planting release

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Control of plantings
Control of plantings

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Control of plantings
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2nd Talk from Iain



1999 BAA Process

Significant Factors Impacting the BAA Process in 1999

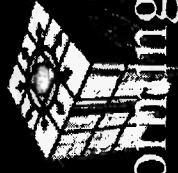
- Re-evaluation of company strategy - LOPW
- Role of the Technology Strategy Managers
Team in shaping the programme
- Software support and maintenance out of the
evolutionary programme
- Recognition that technology implementation is
an issue



TSMT Mandate and Roles

TSMT is an advisory body providing high level strategic steer to SepTAR and ExCom to the programme for technology & services, based on OU business plans and ExCom steers

- Promote a shared vision and whole systems alignment
- Recommend technology strategy including budget levels and technical content/balance
- Advise on technology business framework to promote rapid implementation and to deliver solutions
- Ensure that there is a demonstrable process to measure the estimated value of technology investment
- Contribute to continuous improvement of the TSP (redraft TSP to include agreed roles of TSMT)
- Making recommendations to optimally deploy technology and competencies required to achieve this
- Ensure the views of non represented OUs are considered in forming



the TSMT Sector views

Overarching Principles for BAA Workshops

- Principles of the BAA workshops should be on
 - CUSTOMER - awareness of needs and business drivers
 - VALUE - technology makes a difference and adds measurable value
 - INNOVATION - will be stimulated and encouraged from whatever source
 - COLLABORATION - to be followed internal and external to Shell
 - PEOPLE - improvement and upgrade of skills and competence is fundamental to extracting value from technology
- Workshops to be built around Strategic Cost Leadership principles

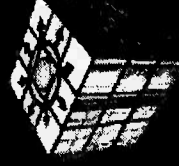


TSMT

- Founded at technology management workshop 10/9
- Objective (special issue Spectrum October 1998):
 - To ensure the technology portfolio is consistent with business direction provided from BUSCOM and will focus on improving the integration of OU and BUSCOM

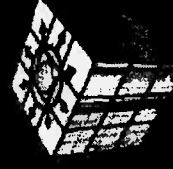
views

- | | |
|---------------|---------------------|
| • Shell Expro | • Far East rep SSB) |
| • PDO | • Small OU rep |
| • SPDC | • SDS |
| • NAM | • SepTAR |
| • Syria | – Paul Sullivan |
| • SEPIV | – Iain Percival |
| • SEPCO | – Keith Eastwood |



Funding Conditions

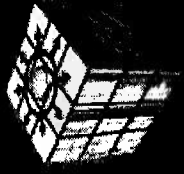
- BAA club has to provide market analysis as condition for funding
- Market analysis determines acquisition route
- No funding without implementation plan
- Have resources/funding for technology transfer
 - transfer knowledge / learning to OU staff and from OU to OU
- Need to identify the how and where of implementation
- Priority setting: value for each OU-BAA tied at N2K level to TOPs and assets



Implementation plans will vary according to type of technology
Joint OU/STEP FRD has been kicked off on improving implementation

ExCom Steers

- Total evolutionary funding for 2000 is US \$ 115 mln (and not lower)
- Work within
 - ExCom agreed budget split across clusters
 - ExCom agreed high level content
 - substantive TOPs (6 man-years minimum)
- Funding model is the 70:30 model
- STV money not to be included in US \$ 115 mln programme



Software Support & Maintenance

- Will be funded as separate service CTR to include:
 - Release, preparation and distribution of software updates
 - Support for operating system updates on agreed platforms
 - Preparation and updating of processing manuals and release documentation
 - Help desk, fault report handling, minor bug fixes and software maintenance
 - Hardware/software/infrastructure advice in terms of systems supported by this agreement, known problems with other systems and any reported conflicts with vendor software or hardware.
 - Testing and quality assurance



Support & Maintenance Service: What is and is not included:

EVOLUTIONARY FUNDING

Development
&
Coding

Research

Prototyping

Productization

(Include alpha, beta
testing and initial
docum.)

**BAA AGREED
ENHANCEMENTS**

BAA Funding

SUPPORT & MAINTENANCE SERVICE

Docum. inc.
web based
material

Pre-
release
testing

Bug fixes

Help
Desk

**ENHANCEMENTS
OUTSIDE BAA's**

Services Funding



From: Hausenblas, Monika M.
To: LartheDeLangladure, J.E.M.; HENDERSON, LYLE L.E. /126773;
Hill, Iman I.; KORNACKI, ALAN A.S. /538643; Lomas, Adam A.;
Ruijtenberg, P.A.; Thomas, Jim J.N.; Waterland, R.D.; Percival, Iain
I.D.R. /SIEP /EPT-AG
CC: Kramer, Sylvia S.; VanHeijst, Hendrik H.J.
BCC:
Sent Date: 2001-03-30 09:35:01.000
Received Date: 2001-03-30 09:35:10.000
Subject: Preview of GIS 2001 communication pack
Attachments: Dear all.doc , GIS overview.doc , FINAL _ GIS 2000 Framework
+.ppt , GIS scorecard 2001.xls

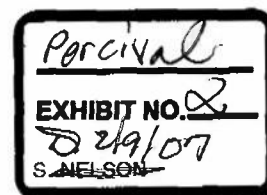
Dear all,
please find attached a preview of the GIS 2001 communication pack that will go out to all GIS
staff very soon (hoped it would be this week but I just heard from drafting that it will be
beginning of next week)

It consists of

- a letter signed by Iain
- a brochure of the GIS 2001 framework (note: this is NOT the final version, which is non-PC
compatible and with drafting, but I send you something pretty close)
- an overview of the GIS sub-clusters
- the draft 2001 GIS scorecard and
- a list of participant of the February workshop (= second page in document "Dear all" below)

Please find the documents attached.

Kind regards,
Monika



26th March 2001

Dear colleagues,

In early February, staff from all parts of GIS (Geoscience and Integrated Service) came together for a workshop to discuss the way forward in 2001 for our cluster. The deliverable for this workshop was an updated version of the GIS 2000 framework.

The GIS framework was developed last year by the Cluster Leadership Team. Whilst we genuinely believed that we had created an excellent reference frame against which to measure the cluster's activities and achievements, we found at the same time that we had failed to create enthusiasm and ownership for this document with staff. In order improve its quality, increase buy-in and create true ambassadors for the document, this year a number of non-leadership-team GIS staff have been invited to work the 2001 version of the framework. During a couple of energetic days, the 30 participants were asking questions such as:

- Are we utilising the synergies within GIS to their full extent?
- What's the added value of GIS versus a collection of teams at P&L (subcluster) level?
- Are we aware of threats and opportunities from outside GIS and ready to face them?
- Do we reflect the priorities "care for the business" and "care for the people" within GIS?

The outcome of the discussions on those and other topics is summarised in the GIS 2001 framework you will find attached. The framework considers outside factors affecting GIS, it includes our main Deliverables for 2001 (with accountable action parties identified), our Business Objectives (aligned with SEPTAR CVICP) and Critical Success Factors (the enabling structure) essential to achieve those objectives.

It's a reference against which we want to measure our activities and against which we would like to appraise ourselves at the end of the year. And it's also a commitment of our leadership team to you – measure us on the deliverables.

Please have a look at the enclosed information and don't hesitate to approach anyone having participated in the workshop in case you have questions about the framework. Whilst I don't expect you to be familiar with all the details of this framework, I very much hope that it will be discussed and live at sub-cluster meetings and that all of us have a similar understanding of the spirit we try to capture within this document.

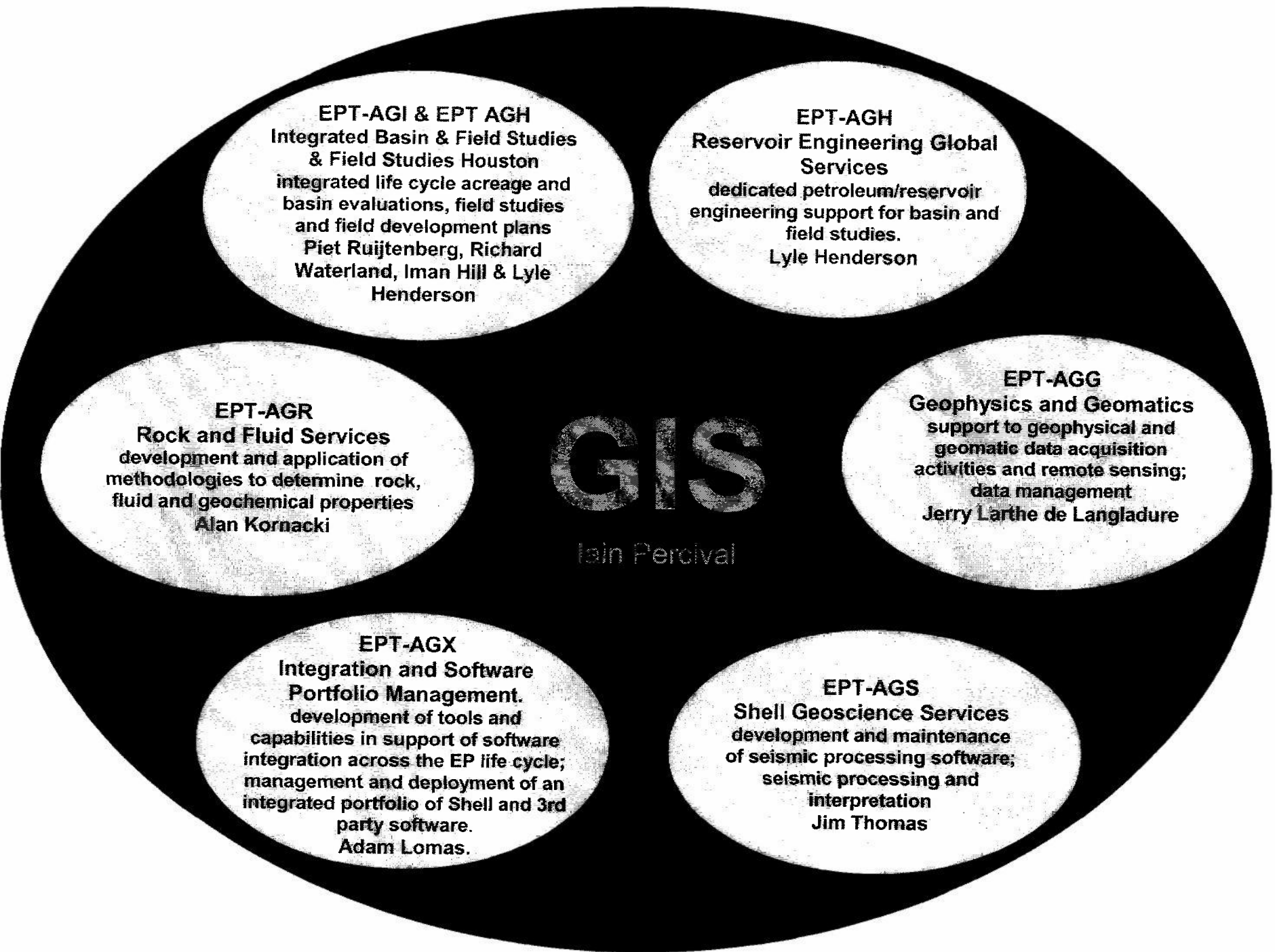
Enclosed:

1. The GIS 2001 FRAMEWORK
2. What is GIS? – an overview
3. The GIS 2001 team scorecard
4. List of attendees

GIS 2001 Workshop

List of attendees

Biegert, ED E.K. EPT-AGG
DeGraaff, E. EPT-AGS
Desmond, Lester L. EPT-HO
Groenendaal, Henk H.J.J. EPT-AGS
Haas, Henk H. EPT-AGR
Hausenblas, Monika M. EPT-AGI
Henderson, LYLE L.E. EPT-AGH
Hill, Iman I. EPT-AGI
Hite, Bob R.H. EPT-AGH
Huang, Chuping C. EPT-AGX
Holley, THOMAS T.K. EPT-AGS
Kornacki, ALAN A.S. EPT-AGR
Lamond, J. EPT-AGG
LartheDeLangladure, J.E.M. EPT-AGG
Lomas, Adam A. EPT-AGX
Lutz, Jos J.B.M. EPT-AGS
Nijenhuis, Ivar I.A. EPT-AGI
Okorafo, Chima C.R. EPT-AGI
Percival, Iain I.D.R. EPT-AG
Podlaha, Olaf O.G. EPT-AGR
Rosen, RICH R.L. EPT-AGR
Ruijtenberg, P.A. EPT-AGI
Russell, SUZANNE S.J. EPT-AGR
Smith, A. EPT-AGS
Thomas, Jim J.N. EPT-AGS
Thomas, MARK M.A. EPT-AGH
Tjan, T. EPT-AGS
VanEs, Rob R. EPT-AGG
Waterland, R.D. EPT-AGI
Wen, Charlie C. EPT-AGX
Witte, S. EPT-AGG



GIS 2001 Framework

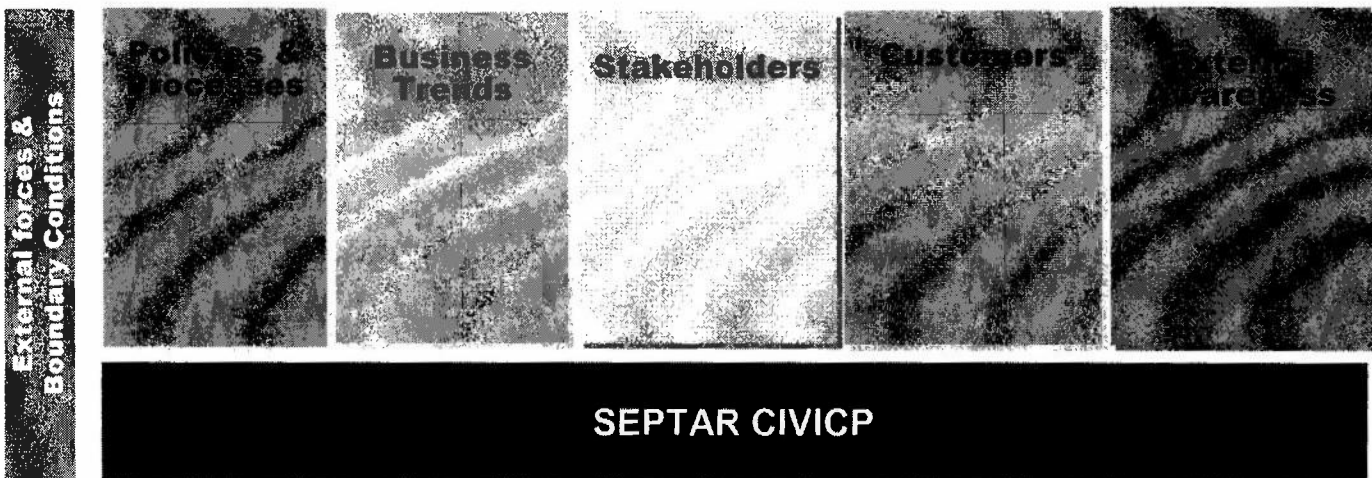
Geoscience & Integrated Services Cluster

What does this document mean to me and my team?

The GIS 2001 Framework is designed to set out clearly and concisely for all stakeholders, but in particular the staff, what the essence of the cluster is. It should further help us to translate the demands from the world around us, and result in: reduced bureaucracy, yet appropriate control; better insight in the forces affecting us; help define clear tasks; provide a transparent process and a clear definition of responsibilities; and provide better alignment of individual and STEP/EP aspirations

Each team and individual is responsible for contributing to the deliverables of the GIS cluster and SepTAR. The GIS 2000 Framework will be 'converted' into a team framework with clearly defined, measurable deliverables identified therein. Within this, each individual will have a clearly defined 'rules for team' and 'rules for individuals'.

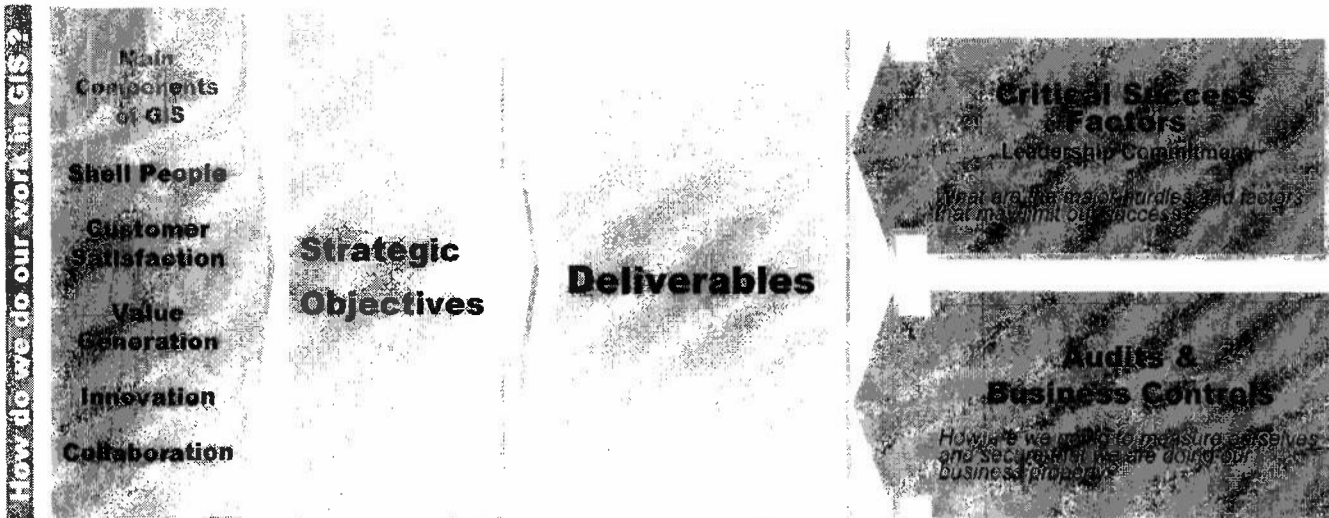
Layout of the GIS 2001 FRAMEWORK:

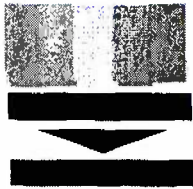


What this means to GIS

GIS VISION:

The full asset life cycle solution service partner of first choice - a challenging and rewarding place for people to work.

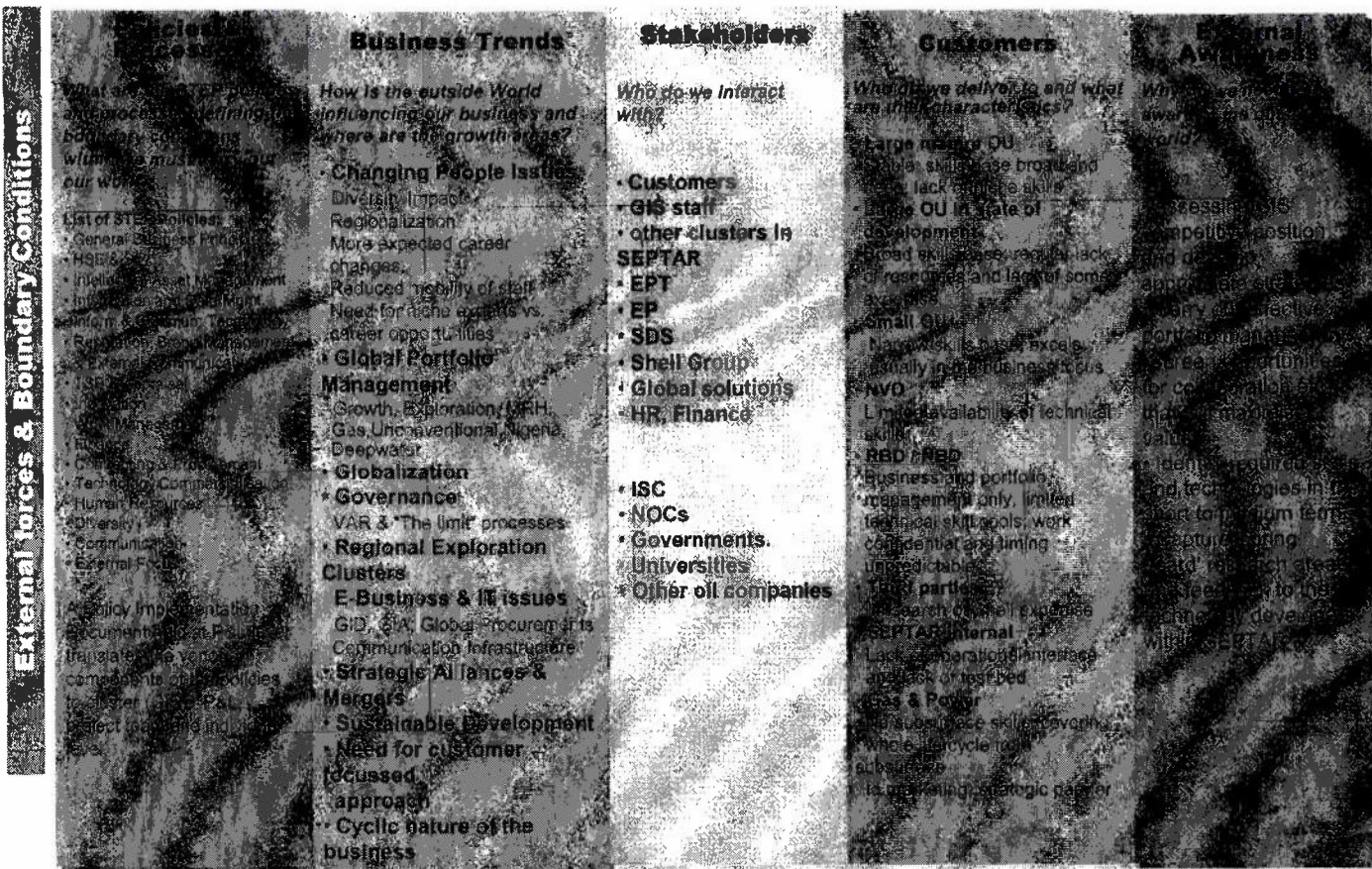




GIS 2001 Framework

Geoscience & Integrated Services Cluster

VP: Iain Percival



SEPTAR CVICP

What this means to GIS

GIS VISION

The full asset life cycle solution service partner of first choice - a challenging and rewarding place for people to work.

Geoscience & Integrated Services Cluster

VP: Ian Percival

SEPTAR CVIC P**What this means to GIS****GIS VISION**

The full life cycle solution service partner of first choice
- a challenging and rewarding place for people to work.

External forces &
Boundary Conditions**Strategic Objectives****HSE4S**

- Ensure the health and safety of GIS staff
- Protect the environment
- Protect the security of GIS assets.
- Deliver products and services that meet the HSE requirements of GIS, our customers and other stakeholders

People

- Increase competencies and skills of GIS staff
- Provide a stimulating work environment
- Enable healthy work/life balance.

Customer Satisfaction

Become the customers preferred partner

Value Generation

Maximize and demonstrate the value of our technology.

Commercial Practices

- Cost Recovery

Innovation

- Promote a culture of innovation and provide a window on technology development.

Collaboration

- Emphasize the "I" in GIS
- Improve efficiency, avoid duplication, leverage resources
- Reduce frustration and add value by working together within GIS and other stakeholders
- Make collaboration a preferred mode of operation

Critical Success Factors - Leadership Commitment**HSE4S**

- Medium/high risk hazards & activities identified and controlled
- Infrastructure in place and implemented HSE program
- Teams & CLT have the competency to develop/implement HSE plan
- Staff have enough time to perform their HSE duties
- Staff are knowledgeable about exponential requirements

People

- Staff understand PDA process and are coached to frame their plan in OLP terms
- Sufficient training budget available
- CLT engage staff periodically using Coaching for Performance Skills In addition to annual appraisal
- Alignment with SP strategic objectives
- Mentors and CLT committed to help develop FAs

Customer Satisfaction

- Use customer feedback (score card)
- Have a proper skills base
- Have a Resource Management process in place
- Have functional IT infrastructure

Value Generation

- Create information for common entry point portfolio information, marketing, service and communication for GIS
- Create repeat business and new business
- Estimate value added in project and, preferably by the customers
- QA process in place for individual P&Ls

Commercial Practices

- Have infrastructure and tools in place

Innovation

- Individual Recognition & Reward
- Game changer Awareness
- Best practice sharing, integration and communication
- Create specific (non-billable) time
- Contribute to TSP and BAA processes
- External focus and Technology Awareness conferences, journals

Collaboration

- Define gaps/overlaps for integrated services between P&Ls
- Develop process to share project information
- Develop joint marketing material, strategy and action plan by and for
- Get joint resources going by 12
- Define best practice workflow
- Make resources available, each cluster to appoint one person who can spend 25% of time on collaboration

How do we do our work in GIS?

Audits / Business Controls**HSE**

- HSE M6 document
- HSE statistics at
- HSE audit

QBR**People**

- PDA process
- Progression system
- FA Development plans
- Score card
- GIS people survey

Customer Satisfaction

- Quarterly customer score card review

Value Generation

- Quarterly review of P&L and value data

Commercial Practices**QBR****Innovation**

- Score card and QBR
- Personal Development & Appraisal

SEPTAR CVIC P

What this means to GIS

GIS VISION

The full life cycle solution service partner of first choice
- a challenging and rewarding place for people to work.

Deliverables

What do we have to deliver to meet SepTAR and STEP criteria and 'winning formula'?

HSE&S

- Sustain no LTIs, share near misses & incidents recorded in Sirens (target: 50 cases recorded) *[Jerry & Adam]*
- Occupational Health - investigate illness reasons and review next steps by Q2; have a plan in place by Q3 *[Jerry & Adam]*
- Each P&L will implement their HSE Plan including learnings from near misses *[all]*
- Each staff member to identify at least one personal HSE&S goal on their PDA plan. *[all]*
- AAll staff will understand and comply with US Export Control requirements with responsible parties identified *[Iain Sinclair]*
- For each CTR agreed HSE&S sustainable development requirements with responsible parties identified *[CLT]*

People

- Staff & Cluster Leaders will prepare a 2001 PDA Plan in CVIC terms with accountable time elements identified *[CLT]*
- Sustain CFP culture and informal 360 feedback. Maintain 100% CFP training *[CLT]*
- CLT to identify and close gaps in resourcing requirements *[CLT]*
- Implement Early Career Review Process. *[Piet]*
- GIS will organise a quarterly joint technical training event *[Lyle]*
- Review staff work/life balance at every QBR *[Lyle]*
- Implement diversity FRD recommendations *[Lyle]*

Customer Satisfaction

- Develop a GIS Services and Marketing Strategy - appoint professional marketer by end Q1 *[Iman & Adam]*
- Cluster will maximise use of EPNL for marketing and technology transfer (target: 12 GIS EPNL articles) *[Jerry]*
- Set up Project Management training and tool for GIS *[Richard]*
- Develop Prioritisation Framework and contingency plans (outsourcing) *[Piet]*

Value Generation

- Mechanisms in place to measure value of GIS service products by 1 June *[Iman]*
- QBR of 'value-add' (reserves, production, UTC, reduction of uncertainty) *[all]*
- Competitive Positioning of key services at P&L level by 1 July *[Alan]*
- Include value indicator specific to services on customer scorecard *[Richard]*
- Be a leading implementer of SEPTAR R&D technology *[Adam]*

Commercial Practices

- Achieve P&L financial targets at GIS level *[Frank & Jim]*

Innovation

- Best Practice sharing and learnings at end of major projects at GIS level *[Richard]*
- Measure new services, new customers and new products *[Piet]*
- GIS wide idea generation workshop by 1/7 *[Jerry]*
- Capture small wins *[Jerry]*
- Implement "Project Framing" for major projects by Q1 *[Richard]*

Collaboration

- Generate proposal and plan for a "One Stop Shop" by end of Q1 *[Jim]*
- Take a leading role in software applications & work flow integration - SEPTAR internal & external software portfolio management *[Iain]*
- Agree and manage overlaps in portfolio with SEM CLT *[Iman]*
- Follow up challenge review sessions with SDS *[Piet]*
- Coordinate/monitor CSFs for collaboration *[Iain]*

External forces &
Boundary Conditions

How do we do our work in GIS?

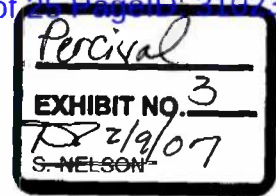
Strategic
Objective

Critical
Success
Factors
Leadership
Commitment

Audits &
Business
Controls

GIS Cluster Scorecard - 2001

| Key Performance Indicator | | Below | On Target | Over Target | Value |
|---------------------------------|-----------|-------|-----------|-------------|--|
| <u>VALUE CREATION</u> | | | | | 45% |
| <u>Technology Delivery</u> | (P&L) | | | | |
| Customer Scorecard | | 68% | 75% | | 25% The score will be supported by customer scorecards covering at least 80% the funded program for GIS projects completed during 2000. |
| <u>Innovation</u> | | | | | |
| GIS GameChanger+ Small Wins | (Cluster) | 25 | 50 | | 10% Total 100 points to be achieved with combinations of all 3 elements |
| Score SW - 1, GC2 - 3, GC3 - 9 | | | | | |
| New Products/Services/Customers | (Cluster) | 0% | 10% | | 5% This innovation element is a measure of the amount of the GIS effort that involves new customers, or new products and services. A "new customer" is an O&U team or asset that didn't use the product or service during 2000 or an existing customer (e.g., NBO) for which the service is performed in a new area. A "new product or service" includes the first application of a standard product or service for a customer, or the implementation of any technology or service developed during 2000-2001. |
| EPNL Articles | (Cluster) | 0 | | | 5% |
| <u>OPERATIONAL PERFORMANCE</u> | | | | | 45% |
| <u>Commercial Practices</u> | (Cluster) | | | | |
| Balance P and L | | 5% | 0 | | 15% Measure restricted to controllable costs and those charges that are subject agreed budgets. The definitions and cost recovery factors have yet to be clarified with C and F. |
| <u>HSE&S</u> | | | | | 10% |
| HSE Plan executed (%) | (P&L) | 50 | 75 | | 5% The score includes both execution and timeliness. You must complete the items within the deadlines set out in the plan. |
| Near Miss reporting | (Cluster) | 2 | 5 | | 5% The near miss reports should include learning points in order to count toward the total. VP review to be final arbiter. |
| <u>People</u> | | | | | 20% |
| % of staff PDPs executed | (P&L) | 40% | 90% | | 15% PDPs to include elements of training, accountable time personal contracts/CTRs and work/life balance plans. Execution means that the PDP is actively managed to completion within the year by the individual and supervisor. |
| Collaborative activities | (Cluster) | 0 | 5 | | 5% Activities that are undertaken jointly within the sub-clusters or activities that promote the implementation of the one stop shop. Cooperative events (workshops, field trips) score 1, x-sub cluster temp assignments of more than 2 man months score 2. |
| P&L Allocation | | | | | 10% This has been left deliberately blank to reflect the diverse set of skills and teams that we have within the GIS cluster. The P&L sponsor, together with his teams, will allocate a team-determined performance indicator which is specific to their work. This will be measured as 10% of the total scorecard. |
| Total Performance | | 0.0 | 10 | | |



JOB APPLICATION: HEAD VENTURE GENERATION
JOB ID: 20020128174528

APPLICANT: IAIN D. R. PERCIVAL

REASON FOR APPLYING

We appear to be at a real watershed in Shell's EP business. The promises made by the business over the past few years to grow organically have failed to deliver, I do not understand why some of the elements in the EP portfolio are there, we seem to be betting the farm on deepwater and generally appear to believe that Technology will ride to our rescue. Overall, from my perspective, there is a growing lack of appreciation or feel for how the complex mix of contributing factors essential for successful upstream business actually works. I feel that I can bring real value to the "business of generating new business" from the personal portfolio of skills and competencies I have built over the past 28 years with Shell. This value will be generated by capacity to challenge, appreciation and feel for what works and what does not in the technology domain, a high degree of intuition regarding volumetric estimates and an ability to read an upside and sense bear traps, an ability to read people and decide what makes them tick – both Shell staff (motivation) and 3rd parties (business discussions).

FORMAL QUALIFICATIONS

BSc (Hons) Geology, MEng. Petroleum Engineering, MBA

EXPERIENCE

Rather than provide a chronological review of the jobs I have held, I prefer to refer to "Experience & Qualifications Required" in job broadcast.

Solid Engineering and / or Geological Know How

- Hands on experience as Head Production Geology and subsequently Chief Petroleum Engineer (S. Oman) with PDO (1985 – 1991)
- Functional Head Petroleum Engineering (Development Manager) and Champion Area (proto) Asset Manager (1995 – 1998). The Champion Area job required building a depth of knowledge in the fields of engineering, production and maintenance (asset integrity). Peculiarity of DM job was requirement to defend (continually) the medium / long term production forecast and underpinning review of hydrocarbon resources to the Petroleum Unit of Brunei Government.
- Close association with and input to the Sector Technology Development Activities as V-P in SEPTAR.

Supervisory Experience / Span

- Current job entails managing / enabling / what have you close to 400 staff in Houston and Rijswijk working in a large number of technical service and technology provision teams covering Integrated Basin / Field Studies, Seismic

Processing, Geophysical & Geomatics advice, Rock & Fluid Property Analysis, Software Portfolio Management and Maintenance.

Prior Business Development Experience

- Head New Business Opportunity Evaluation (EPX/17) in SIPM organization (1992 – 1995). Worked closely with the rest of EPX/1 and EPO/1/2/3 to evaluate global opportunities with the exception of CIS which was worked by the then Russia Team. Approximately 200 opportunities evaluated by own team but pulling heavily on project specific assistance from EPD and EPO organizations. Specific meaty pieces of work: CHAD - Shell representative for 2.5 years on the Technical and Operating Committees, Exxon operated, Elf other partner. Involved with negotiations with Chad and Cameroon governments, World Bank and of course partners. POLAND, ROMANIA, ALGERIA – field evaluations, asset inspections and subsequent negotiations (Algeria and Romania, discussions conducted in French). INDIA (Rava and Tapti fields) – field evaluation and asset inspections and subsequent negotiations. PERU – revaluation of Camisea and subsequent technical discussions / negotiations with Mobil. ARGENTINA – technical advisor to Shell Capsa on several acquisitions, follow up negotiations with owners, potential partners. Much interface and close working with previous SIPM economics, finance, tax, legal, entities.
- Chairman of the Board for Shell / Baker Hughes JV “e2-Tech” 1999 – 2001.
- Member of VSF.

People Related

- Active for many years in domain of skill development and proactive mentoring both in OUs (PDO, BSP) and SIEP. Sponsor of the FA community in SIEP and close interaction with each EP.00 course.
- SPE Local Board Member in Oman and Brunei. Was active driver to start the Brunei Section, established in 1997.
- Worked on (sub)committee establishing course objectives and content for petroleum engineering and geology at Sultan Qaboos University in Oman.
- Will become AAPG Ambassador for European universities in 2002.

CV Gap(s) / Assessment of Key Competences

- I would assess my CV as being very strong except in the domain of “Broad Commercial”. My recent experience has been one of working with tariff structures and fairly well defined guidelines. Troubleshooting has been often undertaken, but not much required in the way of adapting. However, I presume EPB is awash with a wealth of this type of expertise & experience and I am not slow to probe and ask.

Iain Percival
8 February 2002

2002 PERFORMANCE (ACHIEVEMENTS) RECORD
IAIN D.R. PERCIVAL



Focus Areas

1. Client

The client base is a global one encompassing support to mature assets / new business in Nigeria, Oman, Venezuela, Global Exploration and New Business Development support. My personal focus has been on personally driving / encouraging **improved QA / QM** through use of 3DATW especially project framing. This has been achieved – all projects of any significant size go through the process. I check on this by attending in person project reviews prior to scheduled client milestones (VAR, toll gate, etc) and project framing at kick off where I specifically ask questions on **technology applications planned** and **safety critical activities** (uncertainties wrt fault picking, pressures, composition, etc). I attended a total of 22 such “events” in Rijswijk, Aberdeen and Houston (both Belaire and Woodcreek).

2. Collaboration

I took this up as my prime focus area for 2002

1. Following the SEPTAR ELT in Galveston at which we all committed to **winning together**. The two areas I picked up on were (i) **dramatically improving (SEM cluster) technology implementation** and (ii) **increasing use of technology for collaborative working**.

- (i) put in place aggressive plan focusing on #1 Explorer and MHR Technologies plus associated training. The plan was exceeded. (see attached note as demonstration of the personal drive and commitment)
- (ii) insisted on use of VR technology for interactions between Rijswijk, Houston, Aberdeen, Muscat (Port Harcourt not possible). Increased useage between two and three fold AND captured many learnings on hardware / software incompatibilities which will improve performance.

2. Took over the co-sponsorship of the “**Nigeria Seamless Team**” from Jerry Vertal at mid year. At first meeting challenged the emphasis on achieving number of RtL, VAR activities as a performance metric and proposed alignment / impact on business imperatives (gas / oil portfolio options, achieving production targets, reserve booking, asset integrity) instead. This has been worked in the interim (not easy!) but will be ready for implementation in Q2 2003. Attended two face to face and two virtual meetings in 2002.

3. Following the STEP 50 event in May engaged myself for the rest of the year in the formation of what has become **EP Solutions** by bringing together GIS from SEPTAR and EDP from SDS. Personally wrote the TOR which were adopted with almost no change by the STEP LT. This has not been easy. For the first few months the mind set was definitely one of developing “SDS +”, i.e. little to no change for SDS but huge change and loss of many best practices for the GIS community. In addition, for much of Q3/Q4, the large dominant AGI entity in GIS also saw little to no reason for change and the GIS Houston entities feared loss on identity. For several months I was left to engage in a very lonely struggle. However, the effort has been worth while. The communities have bought into the change, a new powerful machine will emerge – but I personally will reap no reward from the effort!

(Note - In resisting the initial attempts to effect a “SDS takeover”, I did myself no favours in being regarded as non cooperative. However, the eventual outcome has supported my stand).

3. Value Generation

Monetisation of the results from the activities in GIS (reserves and production) I can claim no direct credit for. My personal focus was on **driving externalization / brokering of technology**. The success has been in the development of a quality assured farming out of core and fluid properties analysis work. In the course of 2003, what I drove with respect to **QA requirements in the rock property analysis domain into CoreLab could become an industry standard** (accepted by the Society of Professional Core Analysts, Exxon, Chevron). This standard acceptance did not develop as I had hoped in 2002, but will happen in 2003. In addition, despite major objections from the leadership of the MHR BAA in SEM, I **encouraged the use and adoption of 3rd party static modeling product PETREL** knowing it would be quickly adopted by many of the “less sophisticated” users in OU’s. This has happened to a huge extent enabling value to be extracted from better static modeling than would have been the case if only Shell’s GEOCAP had been available. In this whole area of “value adding portfolio of Shell and 3rd party software” applications implementation, I have taken a supportive profile to PMI (see attached note).

4. Innovation

Inspite of being “only a service provider”, I encouraged the GIS population to keep the **feedback of improvement ideas** to the development teams (in particular through the vehicle of collaboration, see 2.1., above). We achieved a very high score and by doing so felt tightly bound into the STEP technology machine.

5. People

1. I took personal responsibility for the complete **rehabilitation process of Adam Lomas** in Q4 2001 through entrusting him with a high profile role in the original TOE planning. This I carried through into Q2 2002 by continual coaching and mentoring.
2. Personal interest in and driving of **improving on boarding process** resulted in the development of best practices in GIS (AGI in particular).
3. Pushed for improvements in developing the **management and mapping of skills to business needs** in the large and dynamic AGI. I recognized it to be a critical success factor in adding value and customer satisfaction. The process has turned out to be so successful it **will be adopted by TOE as a template for global roll out!!**
4. Have been an active and high profile **sponsor of the diversity effort** in STEP.
5. Have taken an **active role with the EP 00** in demonstrating to them they are important. Have spent time with all 5 courses in 2002 – introduction day to STEP in Rijswijk, spending two evenings per course as technical advisor to the teams working the Rabi Field Project, panel member on two of the five project close out presentations.
6. Active(very) **member of** the Aberdeen and Robert Gordon’s Universities **Shell Campus Ambassador teams**.

From: Masalmeh, S.
To: Bosschieter, Thora T.M.F.
CC: Percival, Iain I.D.R. /SIEP /EPT-AG; Mintz, Mike M. /SIEP /EPT-AN; KORNACKI, ALAN A.S. /SIEP /EPT-AG /538643; EPT-AGR-CORES
BCC:
Sent Date: 2000-03-24 14:57:56.000
Received Date: 2000-03-24 14:58:06.000
Subject: RE: Message on behalf of Fred Hoffman and Iain Percival - Highlights March
Attachments: march.highlight.doc

Thora,

Attached please find three highlights from the CORES team.

Best Regards
Shehadeh

-----Original Message-----

From: Bosschieter, Thora T.M.F.
Sent: Friday, March 24, 2000 3:01 PM
To: EPT-AE; EPT-AG; EPT-AGI; EPT-AGG; EPT-AGE; EPT-AGR; EPT-AGS; EPT-AGX
Cc: Mintz, Mike M. /SIEP /EPT-AN; Voogt, Astrid A. /SIEP /EPT; Pirbux, Rafia R.R.G. /SIEP /EPT-H
Subject: Message on behalf of Fred Hoffman and Iain Percival - Highlights March

Dear all,

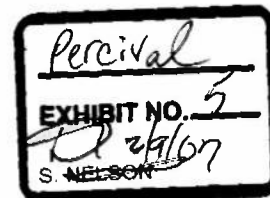
We have not received any highlights from both the SEM and GIS cluster for this month.

Grateful if you could send your highlights to us on Monday 27 March by 09:00 hrs. latest !!

Highlights must be turned in by SepTAR by noon on Monday 24 March.

Thank you for your cooperation.

Met vriendelijke groeten / With kind regards,
Thora M.F. Bosschieter



SEPTAR Leadership Assistant
SIEP B.V.
Personal Assistant to Paul Sullivan
tel. 31 70 311 2427
fax. 31 70 311 2111
mobile: 06 54 77 14 76

SepTAR HIGHLIGHTS – March 2000

GIS CLUSTER

CORES team; EPT-AGR

State of the art Special Core Analysis Increases Reserves for Mandarin Field

*Shell Expro has performed a state of the art Special Core Analysis program for the Mandarin field following the guidelines handed out in SepTAR's PW15 course. The experiments were performed by a contractor (Core lab.), the data were given to the CORES team for quality check and interpretation using the MoReS SCAL decks developed by us. As a result of the study, Corelab had to repeat part of the experiments (at no additional charge) and **reserves were increased by 1-3 MMbbl**. A follow up study is taking place to minimise the uncertainty in the reserves.*

More Oil from Transition Zones

*The mobility of oil in the transition zone has been studied for the second year to assess the scope of oil recovery for the Lekhwair C field in PDO. **Our results show that there is a big scope for recovery: 50 MMbbl**. PDO is planning a water flood pilot starting 2000; an approximate investment of 2.4 mln\$. Without this study, this field would not have been developed.*

Proved Ultimate Recovery Increase For Ghafeer Oil Discovery (value 15.8 mln\$)

A core analysis service project was performed by the CORES team in 1999 to assess reserves in Carbonate Stringers in PDO. The Carbonate Stringers are new discoveries and have a significant potential (current reserves 1100 MMbbl).

*Contractors were not able to properly assess this difficult reservoir. We measured oil relative permeability curves which resulted in increased ultimate oil recovery for the Ghafeer field. **The measurements can be credited with 10% of the total ultimate recovery increase, representing a value of 15.8 mln\$**. The data will be also used in new reserves bookings and in reserves revisions in the future.*

From: MARHUBI, AMRAN A.A.A.
To: Ollerearnshaw, Steve; SCHOTMAN, GERALD G.J.M.; Hinai, Saif S.H.; MANN, PAUL P.J.
CC:
BCC:
Sent Date: 2001-09-30 14:52:06.000
Received Date: 2001-09-30 14:53:35.000
Subject: FW: PDO studies for SepTAR
Attachments: TOR_FHD_FG_NW-S.DOC , LekUS_ToR.DOC , Natih_TOR.doc , ZL_terms_of_reference.DOC , TOR NE-SEPTAR.doc , TOR Ghaba North_SEPTAR follwo-up_01.doc , NimrG_tor_updated.doc , Nimr C_TOR_Sept_2001_1b.DOC , AK_SE AB_TOR_new format.DOC , Birba 2002 study proposal 2.doc , AminTORSepTar.DOC , KMW_Mahwis_TOR_Yr2002.doc , Rahab VAR1 proposal.doc , Tor.doc

-----Original Message-----

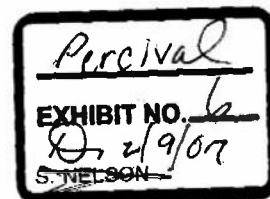
From: Meijssen, Thomas OQP (UPR)
Sent: Sunday, September 30, 2001 7:20 PM
To: Van der Schoot, Ad SIEP-EPT-AB
Cc: Marhubi, Amran OFM (UPD); Schotman, Gerald CEM (UCL); Ruijtenberg, Piet SIEP-EPT-AGI; Willis, Rob SIEP-EPT-AGI; Riyami, Abba OMP; Blair, Iain OYP (UPT); Taylor, Steve OFP (UPG)
Subject: PDO studies for SepTAR

Ad,

Please find attached the draft TOR for the PDO studies which could be farmer out to SepTAR.

The list comprises of:

- * Fahud Natih EFG NW-S
- * Natih Tail end
- * Lekhwair Upper Shuaiba
- * Zauliyah
- * Al Gubar
- * Ghaba North
- * Amin
- * Birba
- * Karim West
- * Marmul Al Khalata
- * Nimr C



- * Nimr G
- * Rahab
- * Al Huwaisah

When checking the TORs, we noticed some omissions (e.g. coordinators, data sheets, expected rewards etc.), but the data set provided should give you a good starting point for the scope of work for SepTAR. I will be collecting the additional information tomorrow Monday 1 October 2001 and will send this to you by Email.

To discuss the scope of work and any further questions, I would like to have a telephone meeting with you on Tuesday 2 October 2001 at 11.00 hours Netherlands time (13.00 hours Oman time). Could you please give me a call: +968-675684. I will invite one representative from each asset team to the telephone meeting. If you have any specific questions, could you please send them to me by Email before the meeting?

Best regards,

Thomas Meijssen
CFDH Reservoir Engineering PDO

-----Original Message-----

From: Schotman, Gerald CEM (UCL)
Sent: 29 September 2001 22:45
To: Marhubi, Amran OFM (UPD); Meijssen, Thomas OQP (UPR)
Subject: FW: Status on SepTAR - PDO studies

Gents, FYI

Thomas, trust you received all the CTRs from the teams in good order?

Thanks,
Gerald

-----Original Message-----

From: Van der Schoot, Ad A SIEP-EPT-AB
Sent: Friday, September 28, 2001 1:40 PM
To: Hinai, Saif SH PDO-OD; Schotman, Gerald GJM PDO-CEM
Cc: Crocker, John JM SEPI-EPM; Evans, Stuart S SIEP-EPT-AR; Mann, Paul PJ SEPI-EPM; Megat, Zaharuddin Z SEPI-EPM; Percival, Iain IDR SIEP-EPT-AG; Ruijtenberg, Piet PA SIEP-EPT-AGI; Van der Schoot, Ad A SIEP-EPT-AB; Willis, Rob R SIEP-EPT-AGI
Subject: Status on SepTAR - PDO studies

Saif, Gerald

Just a quick update.

EPM has emphasized the need to have a complete list of projects

available before the PDO board meeting. Practically this means that we need to deliver to EPM by COB (The Hague time) on Tuesday october 2nd:

- a list of projects which require SepTAR contribution
- for all these projects:
 - data sheets containing key data for each project
 - time lines
 - specified resources (names, disciplines)
 - objectives
 - deliverables
 - expected results in terms of production (at this stage this can only be a rough guess)

In order to achieve this time line, we propose we will receive the final list of projects and data sheets no later than Monday start of business Rijswijk.

SepTAR (Stuart Evans, Rob Willis, Ad van der Schoot, plus maybe additional expertise) are available to travel to Muscat arriving Saturday october 13th, assuming the internation situation will enable us to do so.

Could you and Gerald to be in Rijswijk on Friday October 5th, to discuss what actual work can start preceeding further discussions in Oman on October 13th? (Stuart Evans however will not be in Rijswijk on October 5th).

Appreciate your feedback

In SepTAR we found it useful to articulate our thoughts and understanding of where we are currently and the way forward. You will find our thoughts in the attached Word document. Grateful your thoughts and comments on this memo as well.

best regards

Ad.VanderSchoot

Shell International Exploration and Production B.V.
Volmerlaan 8, Postbus 60, 2280 AB Rijswijk, The Netherlands

Tel: +3170311 3095

Email: a.vanderschoot@siep.shell.com

Internet: <http://www.shell.com/eandp-en>

DRAFT TERMS OF REFERENCE

Field:
Project Type:
Project Name:

Fahud Natih EFG NW-S Reserves Development

Revision No: **1**
Proposed By: **OFP/12**
Month: **Sept 2001**

OBJECTIVES OF STUDY

1. Update/Enhance the existing geological/fracture and dynamic model for the Fahud Natih E&FG NW-S area, incorporating the waterflooding pilots results and the available seismic, geological, core drilling and production data.
2. Use the static, fracture and dynamic model to estimate the Ultimate Recovery.
3. Identify and risks assess the optimum development options, as a basis for an Opportunity Development Plan.
4. Document the modeling work and the change in reserve base (PDO Reserves Booking note-for-file)
5. Participate with OFP team in presenting Reserve Booking to the Oman Ministry of Oil and Gas.
6. Transfer knowledge, models and results to PDO OFP staff.

CURRENT STATUS (1.1.2002 ARPR)

Fahud E (10^6 m^3)

| | |
|-----------------------|-----|
| STOIIP: | 161 |
| UR: | tba |
| DR: | tba |
| Cum Prod: | tba |
| Undeveloped Reserves: | tba |
| cSFR: | 2.4 |

No. of reservoirs: 3

BACKGROUND NOTES

The Fahud Field spans 16 km by 2.5 km. The stacked Natih-A to Natih-G reservoirs are heterogeneously fractured and contain an oil column of up to 470 m. In fractured areas the oil is recovered by Gas/Oil Gravity Drainage, providing a relatively low but stable production rate. In matrix or sparsely fractured areas, GOGD is ineffective and therefore waterflooding is more effective in accelerating production and hence increase the ultimate recovery.

In 1995 a well production behaviour analysis highlighted areas of sparse fracturing and kicked off a Natih-E Matrix pilot project. In 1998, some 27 MM m3 of Natih-E NW-N Matrix reserves were booked and are currently being developed. Similarly, in 2001 some 7 MM m3 of Natih-FG NW-N reserves will be booked.

In year 1999-2001 full petrophysical and geological reviews were carried out yielded to STOIIP revision. Furthermore, a field asset-based study was carried out in SePTAR which consisted of seismic, geological, fracture and dynamic modelling for the NW part of the field. The main focus of the study was to build a reliable fracture model, utilizing simulation to firm up the existence and the position of fracture corridors.

Although a simulation model was built for Natih EFG NW for the purpose of qualifying the fracture model, this model at its current status can not be used practically to estimate the Ultimate Recovery, nor can it be used for the forecast prediction. The constraining limits of the current model is its excessive run time. Therefore an enhancement to this model is required before being used for UR estimation and development scenarios predictions, or alternatively another sector model needs to be constructed, similar to the 1998 NW-N E reserve booking.

The current estimate of the Scope For Recovery for Natih E3/E4 and Natih FG for the NW-S area are 1.6 and 0.8 mln m3 respectively, risked with a POS of 40%.

Work completed to date:

- geological and fracture model for Natih EFG for the whole NW area (PDO and SePTAR asset based study)
- simulation model for Natih EFG for the whole NW area to qualify the fracture model; history match until mid 1980's ((SePTAR asset based study)
- simulation model for Natih E NW-N (1998 reserve booking)

Waterflooding pilots :

- Fahud Natih E NW-S Pilot – phase I : 1 inj in 2002
- Fahud Natih E NW-S Pilot – phase II : 2 inj + 2 prd in 2002
- Fahud Natih FG NW-S Pilot : 2 inj in 2002

Planned follow up Waterflooding development :

- Fahud Natih E NW-S development – phase I : 2 inj + 2 prd in 2003 , 2 inj + 2 prd in 2004
- Fahud Natih E NW-S development – phase II : 2 inj + 2 prd in 2003 , 2 inj + 2 prd in 2004
- Fahud Natih FG NW-S development : 2 inj + 2 prd in 2003 , 2 inj + 2 prd in 2004

References:

WORK REQUIRED

See tables below for detailed description of work required per discipline.

DELIVERABLES

1. Updated Fahud Natih EFG NW-S geological and fracture model
2. Fahud Natih EFG NW-S history matched and predicting dynamic model (Enhance and Update the existing)
3. Documentation of the modelling work and the changes in reserve base (PDO Reserves Booking note-for-file)
4. Fahud Natih EFG NW-S Opportunity Development Plan
5. Presentation of Reserve Booking to the Oman Ministry of Oil and Gas (in participation with OFP team).
6. Knowledge, models and results transferred to PDO OFP staff.

Note: PDO expects that these deliverables will be subjected to appropriate peer reviews and value assurance processes.

MANPOWER AND TIME ESTIMATES

| | Responsibility | Man-days (net from) |
|-------------------------|---|---------------------|
| Production Seismologist | Seismologist: 1. Update seismic interpretation using the Van Gogh filtered data in combination with the stopper voxel information (i.e. develop a realistic fault + fracture interpretation based on this information and integrate it with the other geologic data (fault cuts in wells, FMI information, Losses data, etc.)) 2. Develop a velocity cube to convert the existing seismic to depth | 3 mmonths* |
| Petrophysical Engineer | Petrophysics Ensure all available log data is loaded (data should be normalized with regard to curve mnemonics and curve scales) | 1 mmonth* |
| Production Geologist | Production Geology 1. Load all available log information and QC tops in the area of interest. 2. Re-build existing structural interpretation and fault maps using seismic interpretation from above (using Petrel?) 3. Evaluate pilot wells and update fracture model. 4. Incorporate new structural interpretation, fault maps, fracture model and petrophysical data into Geocap and develop geologic model/s for simulation. 5. Propose and evaluate development options together with RE. | 6 mmonth* |
| Reservoir Engineer | Reservoir Engineer Simulation – Full NW-S Area 1. Enhance the existing dynamic model to make it useful for estimating the Ultimate Recovery and prediction for different development scenarios 2. Evaluate pilot well performance and contribute to updated fracture model. 3. Enhance the History Match, incorporating the pilots results 4. Use the model to identify and risks assess different development options, including economic evaluation. 5. Identify the optimum development plan and update the Field Development Plan 6. Reserves booking documentation | 5 mmonth* |
| Engineer (PDO) | FDP engineering issues Consultation with PDO engineering team required. NOTE: 1. This work builds on the 1999/2000 PDO / Carbonate Development Team Fahud Asset Study. Significant optimisation can therefor be achieved by involving as many of the relevant CDT staff as possible in this study. 2. Timings indicated as per PDO 50/50 estimate, assuming updates of existing models are feasible and SEPTAR staff experienced with modelling of fractured reservoir is involved. 3. Timings will need to be revisited if enhancement of existing models. 4. PDO OFP team will need to review the suitability of SEPTAR assigned staff to this project. | |

SCHEDULE

Estimated completion date Q4 2002 (See attached schedule).

| AGREED BY | OFP | OFP/1 | OFP/2 | OFP/3 | OFP/4 | OFP/5 | OFE |
|-----------|-----|-------|-------|-------|-------|-------|-----|
| Date: | | | | | | | |

| | 2001 | | | | 2002 | | | | | | | | | | | |
|-------------------------------------|------|-----|-----|-----|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | Sep | Oct | Nov | Dec | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
| Fahud Natih E NW-S Pilot (phase I) | | | | ◆ | ◆ | | | | | | | | | | | |
| Fahud Natih E NW-S Pilot (phase II) | | | | | | | | | | | | | | | | |
| Fahud Natih FG NW-S Pilot | | | | ◆ | ◆ | | | | | | | | | | | |
| Injection period | | | | | | | | | | | | | | | | |
| Production/Injection monitoring | | | | | | | | | | | | | | | | |
| Siesmic/geology review | | | | | | | | | | | | | | | | |
| Fracture Model Update | | | | | | | | | | | | | | | | |
| Dynamic modelling | | | | | | | | | | | | | | | | |
| Field Deveopment Update | | | | | | | | | | | | | | | | |
| Reserves booking | | | | | | | | | | | | | | | | ◆ |

Expected injection response

| | 2002 | | | | 2003 | | | | 2004 | | | | 2005 | | | | 2006 | | | |
|-------------------------------------|------|----|----|----|-------|----|----|----|-------|----|----|----|------|----|----|----|------|----|----|----|
| | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 |
| Fahud Natih E NW-S Pilot (phase I) | ◆ | | | | | | | | | | | | | | | | | | | |
| Fahud Natih E NW-S Pilot (phase II) | ◆ | | | | | | | | | | | | | | | | | | | |
| Fahud Natih FG NW-S Pilot | ◆ | | | | | | | | | | | | | | | | | | | |
| Production/Injection monitoring | | | | | | | | | | | | | | | | | | | | |
| FDP and Reserves Booking | | | | ◆ | | | | | | | | | | | | | | | | |
| Fahud Natih E NW-S Development PI | | | | | 2P+2I | | | | 2P+2I | | | | | | | | | | | |
| Fahud Natih E NW-S Development PII | | | | | 2P+2I | | | | 2P+2I | | | | | | | | | | | |
| Fahud Natih FG NW-S Development | | | | | 2P+2I | | | | 2P+2I | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |
| Expected injection response | | | | | | | | | | | | | | | | | | | | |

DRAFT
TERMS OF REFERENCE

Field:
Project Type:
Project Name:

LEKHWAIR UPPER SHUAIBA
Framework and Development Plan

Revision No: 1
Proposed By: OFP
Month: Sep 2001

OBJECTIVES OF STUDY

1. Build a full FDP for the Upper Shuaiba over the wider Lekhwair area, to feed development activities in Lekhwair A South area, and an appraisal and pilot strategy for the remainder of the area.
2. Document the work executed, transfer knowledge, models and results to PDO OFP staff and participate in communication of the results to PDO internal and external stakeholders.

CURRENT STATUS (1.1.2001 ARPR)

Lekhwair Upper Shuaiba (10^8 m^3)
 STOIP (Booked expectation): 16.04 (includes A South and L-251 area)
 Expl appraisal STOIP (expectation): 42.67
 Cum Prod: 0.23

No. of reservoirs: 1-3

BACKGROUND NOTES

Most of the developed reserves in the Lekhwair field are in the Lower Shuaiba and Kharaib reservoirs. However, there is a substantial STOIP (with gascap) in the Upper Shuaiba, typically in thin (2-4 m thick) and low permeability (~1 – 5 mD) and fractured reservoir layers, which vary areally. A recent waterflood trial in Lekhwair A South has been terminated due to fracture shortcut between injector and producer.

Products required:

1. a coarse model (or framework), based on an integrated evaluation of the available seismic, log, geological and production data.
Also, based on 1 above:
2. a strategy for field appraisal and pilots,
3. a robust development plan for the booked reserves in A South area, explicitly addressing the risks and uncertainties, and incorporating facilities requirements and optimisation

Transfer of knowledge and ownership to development team in PDO and PDO stakeholders will be a critical success factor.

This work will need to be integrated with the ongoing reservoir modelling studies on the Lwr Shuaiba reservoirs (Lekhwair fields), regional Shuaiba studies carried by others (BEG, Joint PDO-Oxidentel Shuaiba study and Yibal, Qam Alam, Al-Huwaisah reservoir models).

Timing start/finish:

Preferably: 1 above to start 4Q01. To be completed 4Q02.

Skills/staff required:

Experienced with low permeability and fractured carbonates. PDO OFP team will need to review the suitability of SEPTAR assigned staff to this project.

Because previous development in Lekhwair has focussed on the Lower Shuaiba/Kharaib, there is a large amount of incidental data (e.g. drill speed logs, cuttings) that will be of relevance to the evaluation of the Upper Shuaiba, and some time/effort will be required to retrieve (in PDO!), organise and evaluate these data.

WORK REQUIRED

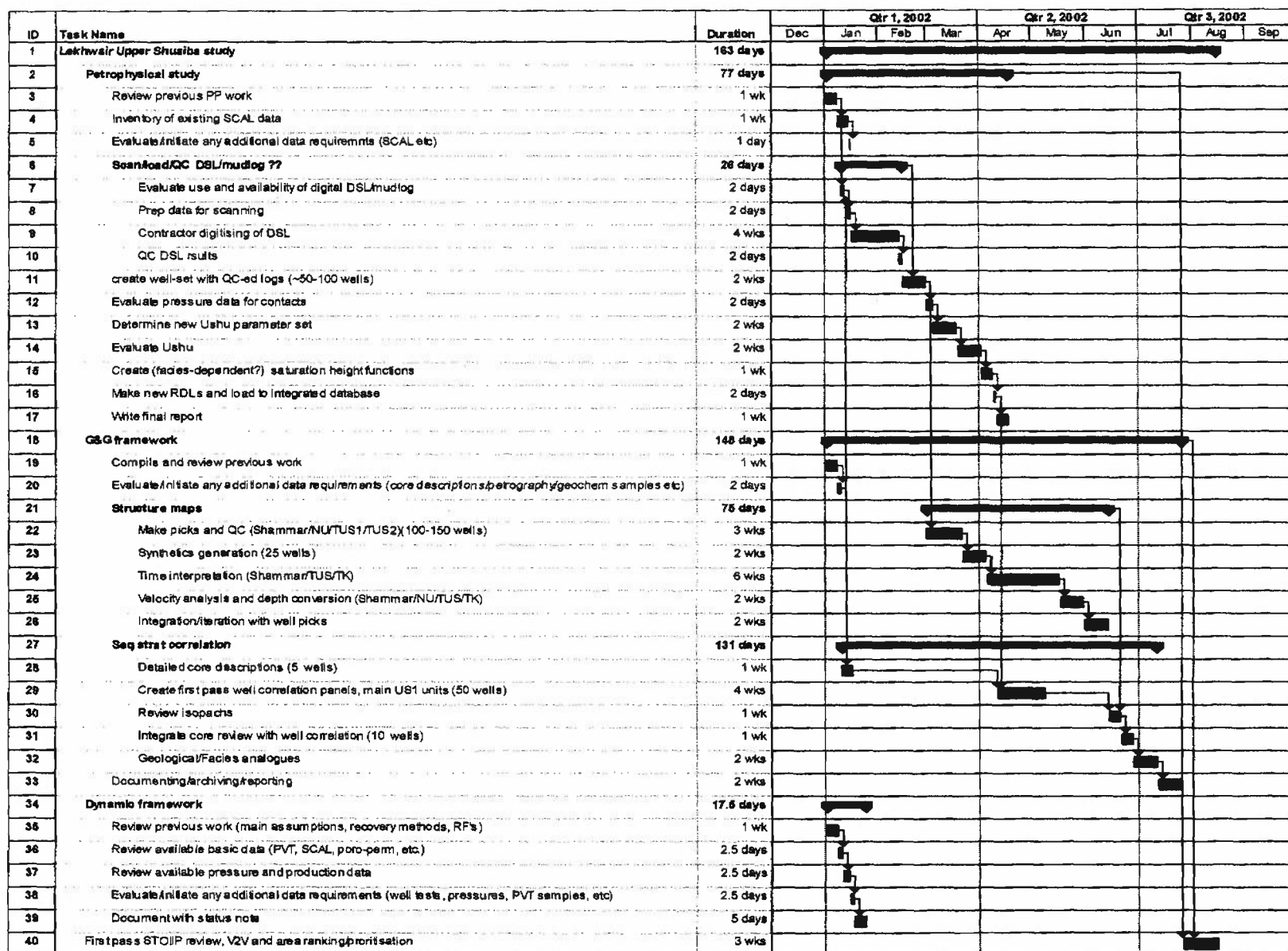
See Gantt chart for detailed description of work required per discipline.

(PDO 50/50 estimate. Amounts to approx 12 man-weeks Petrophysics, 16 m.w. Geophysics, 12 m.w. Geology, 6 m.w. Reservoir Engineering, all for Framework; and additional requirements for FDP preparation). Time for knowledge, model transfer and presentations to be added at SEPTAR discretion.

DELIVERABLES

As specified above

Note: PDO expects that these deliverables will be subjected to appropriate peer reviews and value assurance processes.



DRAFT TERMS OF REFERENCE

Field:
Project Type:
Project Name:

Zauliyah Field Development Plan

Revision No:
Proposed By:
Month:

1
OQP
September 2001

OBJECTIVES OF STUDY

1. Update the FDP for appraisal and well data becoming available November- December 2001.
2. Provide, as part of the FDP, oil, water and gas forecasts based upon relevant development scenarios.
3. Based on the same scenarios, recommend the optimum lift mechanism and production station upgrades.

CURRENT STATUS (1.1.2000 ARPR, MLN MS)

| | | |
|-----------------------|-------|------------------------|
| STOIIP: | 56.39 | |
| UR: | 10.27 | DR: Developed Reserves |
| DR: | 3.00 | |
| Cum Prod: | 4.5 | |
| Undeveloped Reserves: | 2.77 | |
| CSFR: | 12 | |

No. of reservoirs: 5

No. of currently completed wells: 19

BACKGROUND NOTES

Production from Zauliyah field is approximately 1100 m³/day at the moment, and ramping up. A level of 2500 m³/day is anticipated in 2002. The field requires water injection. Very recently water injection capacity has been upgraded from 1500 to 4000 m³/day. Twenty-one wells have been drilled in the Zauliyah field so far, with another 5 wells to be added this year. Four of these wells are appraisal/injector wells on the flank. A recent appraisal well has proved up extra STOIIP on the NW flank. A study is in progress leading to a reserves booking this year. Six wells and another WI capacity upgrade are currently planned for next year.

The following issues exist:

- (1) The current strategy is to execute a flank injection scheme and create water injection patterns on a closer spacing where needed. This strategy at present needs further detailed design. Furthermore, is this the most optimum strategy? Important here are the extent and connectivity of the sands within the 5 reservoirs.
- (2) Station capacity. Are station upgrades needed? Several development scenarios must be worked through to provide production forecasts.
- (3) Flaring. Flaring must be limited by upgrading compressors. The amount of extra compression capacity needed is linked to the choice of long term lift mechanism.
- (4) What is the optimum lift mechanism – ESP or gas lift?
- (5) Production allocation. Production from the various reservoirs is commingled. Reservoir management requires a mechanism to allocate production back to the individual reservoirs.
- (6) Water injection management. A tracer scheme must be implemented.

References:

2. Zauliyah FDP, BDM/028/98
3. Zauliyah Field Review, OBM/002/2000.
4. Zauliyah FDP, OBM/005/2000

WORK REQUIRED

See tables below for detailed description of work required per discipline.

DELIVERABLES

1. FDP Update

MANPOWER AND TIME ESTIMATES

| Person | Indicator | Responsibility | Man-days (net from) |
|------------------------|-----------|--|---------------------|
| Reservoir engineer | | History matched simulation, development scenarios, forecasts | 90 |
| Geologist | | Three Monarch scenarios | 60 |
| Petroleum technologist | | Solution for production allocation, recommend lift mechanism | 30 |
| Engineer | | Recommend station upgrades | 60 |
| Seismologist | | Updated Structure maps | 30 |

SCHEDULE

Estimated completion date Q2 2000, in time for PDO programme build

| AGREED BY: | OQP | OQP/1 | OQP/2 | OQP/3 | OQP/4 | OQP/5 | OQE |
|------------|-----|-------|-------|-------|-------|-------|-----|
| Date: | | | | | | | |

Detailed Description of Work Required

| Resource | Work Specifications | Man Days |
|----------|---|----------|
| PG | <ol style="list-style-type: none"> 1. Building on existing models, provide 3 updated "GEOCAP" realisations for the field. 2. Update static model(s) further if needed for History matching. 3. Document static model in FDP. | 60 |
| ENG | <ol style="list-style-type: none"> 1. Review station capacity issues with OQE/1 2. Specify station upgrades in line with production forecasts by RE and choice of artificial lift by PT 3. Document recommendations in FDP. | 60 |
| PT | <ol style="list-style-type: none"> 1. Review lift options. 2. Review selectivity options. 3. Specify best lift option taking development scenarios, flaring constraints and economics into account. 4. Document findings in FDP. | 30 |
| RE | <ol style="list-style-type: none"> 1. Building on existing MoReS model(s), history match with updated GEOCAP models. 2. Simulate development scenarios and provide production forecasts 2. Provide economic evaluation of development scenarios 3. Document in FDP. | 90 |

DRAFT TERMS OF REFERENCE

Field:
Project Type:
Project Name:

AL GHUBAR NATIH E and SHUAIBA Field Development Plan Al Ghubar Natih/Shuaiba FDP

Revision No: **1**
Proposed By: **OQP/21**
Month: **Sept 2000**

OBJECTIVES OF STUDY

1. Update the 1999 Natih E 3D geological and dynamic model for the full field and incorporate the results of the 2000 vertical interference test and subsequent production history.
2. Construct a 3D geological and dynamic model for the Al Ghubar Shuaiba reservoir, including an updated and integrated seismic, fault, fracture, and core and production history analysis/interpretation.
3. Review STOIMP (Shuaiba only) and estimated ultimate recovery for an optimized recovery mechanism for both reservoirs.
4. Prepare an FDP in time for the project submission to the PB2003 (i.e. March 2002)

CURRENT STATUS (1-1-2001 ARPR)

| | | | | |
|----------------------------------|-----------------------|---|---------|------------------------|
| Al Ghubar (10^6 m^3) | | Natih E | Shuaiba | |
| | STOIMP: | 61.5 | 32.0 | |
| | UR: | 3.9 | 2.2 | |
| | DR: | 2.8 | 1.9 | DR: Developed Reserves |
| | Cum Prod: | 2.7 | 1.8 | |
| | Undeveloped Reserves: | 1.1 | 0.3 | |
| | cSFR: | 17.6 | 9.2 | |
| No. of reservoirs: 2 | | No. of currently completed wells: Natih E: 20 Vt, Shuaiba: 2 VT, 1 HZ | | |

BACKGROUND NOTES

The Al Ghubar Field, situated in the Ghaba Salt Basin, was discovered in 1974. The structure is a low relief, domal anticline bounded to the SE by an ENE-WSW striking normal fault. Hydrocarbons were found in the fractured carbonates of the Natih AB (oil + gas), Natih E (oil) and Shuaiba (oil). The field is currently being produced from the Natih E (172 m³/d) and Shuaiba (182 m³/d).

The Al Ghubar Natih E reservoir has been the subject of a SEPTAR-PDO Asset study in 1999 [ref 1]. This study resulted in the development of two contrasting static/dynamic reservoir models which both honoured available reservoir and production data but point to very different future field developments. The "Bed Bounded Fracture" model is characterised by very good vertical permeability and could allow for an economically viable cold GOGD development. In contrast the "Fractured Cemented Streak" model has limited vertical permeability and would imply that only a thermally assisted GOGD development could be economically viable. To test the vertical permeability a vertical interference test was conducted which indicated limited vertical permeability, i.e. the "Fractured Cemented Streak" model is probably the more representative reservoir model, and thermally assisted GOGD is probably the only viable development scenario for the reservoir [ref 2].

Although the Al Ghubar Shuaiba reservoir was not part of the 1999 asset study, the horizontal AG-16 well was included because it is the only horizontal well with FMI coverage [ref 1]. The field was last evaluated in the context of a 2001 fractured carbonate reservoir portfolio review in the Qarn Alam Area [ref 2]. This review, suggested that also for this reservoir, which has a shorter column and less STOIMP than the Natih E, a thermal GOGD development seems to be the most viable development option. In contrast to the Natih E however, no up-to-date static and/or dynamic reservoir model exists.

Based on the successful thermally assisted GOGD pilot in Qarn Alam Shuaiba and the results of the portfolio review, the risked cSFR in both the Natih E and Shuaiba reservoirs has been increased by xx to reflect the potential impact of such an EOR development.

Because of the synergies between the Natih E and Shuaiba reservoirs and the cSFR upside, the Al Ghubar field is viewed as an attractive medium term thermal GOGD development with estimated UTC's ranging between 4 and 6 \$/bbl. Because of the facilities leadtimes, a minimum of 2 years should be considered between FID and first oil. It is therefore crucial to get a fully up-to-date FDP for both reservoirs soon.

This project aims at updating all data and interpretations to create integrated 3D static and dynamic reservoir models for the Natih E and Shuaiba. The new reservoir model will be used to evaluate the feasibility of a full field Thermal GOGD development (or potential other development scenario's) and support maturation of the cSFR carried in the ARPR.

References:

1. Al Ghubar Asset Study, Report SIEP 99-5801, December 1999
2. Development Strategy for Qarn Alam Fractured Carbonate Fields (excl. Qarn Alam). Report OQP/01/060R, June 2001.

WORK REQUIRED

See tables below for detailed description of work required per discipline.

| DELIVERABLES | | | | | | | |
|---|-----------|--|----------------------------------|-------|-------|-------|-----|
| Natih E: | | | | | | | |
| 1. Updated 3D static reservoir model including results of vertical interference test. | | | | | | | |
| 2. Full field dynamic model. | | | | | | | |
| 3. Multiple scenario evaluation to account for geological, dynamic and development uncertainties. | | | | | | | |
| 4. Updated reserves estimate. | | | | | | | |
| Shuaiba: | | | | | | | |
| 5. Interpretation of the 3D seismic data including filtering of data, top Kharai & Shuaiba horizon interpretation (exp, high, low), time/depth conversion, seismic inversion and seismic facies interpretation. | | | | | | | |
| 6. Fault and fracture model based on seismic and log (FMI) interpretation and fracture-modeling using advanced modeling techniques. | | | | | | | |
| 7. 3D static reservoir model based on integrated seismic, fault, fracture, core and log data. | | | | | | | |
| 8. Full field dynamic model. | | | | | | | |
| 9. Multiple scenario evaluation to account for geological, dynamic and development uncertainties. | | | | | | | |
| 10. Updated STOIP and reserves estimate. | | | | | | | |
| 11. Combined Natih E-Shuaiba FDP | | | | | | | |
| Four Appraisal wells are scheduled for 2003. Field Development Plan in time for PPB 2003 (i.e. March 2002). | | | | | | | |
| MANPOWER AND TIME ESTIMATES | | | | | | | |
| Person | Indicator | Responsibility | Man-days(net from) | | | | |
| SEPTAR TEAM: | | | | | | | |
| Seismology | | Seismic Inversion and Interpretation, synthetic seismic | As Per Attached Work Plan - Time | | | | |
| Petrophysics | | Log interpretation-correlation, Phi-K-So relations, reservoir param. | | | | | |
| Geology | | Core description, Pore Network Classification and FMI analysis | | | | | |
| Schlumberger | | Fracture picking, analysis and consultant | | | | | |
| Structural Geology | | Regional Structural Evaluation: Fault and Fracture interpretation | | | | | |
| Geology | | Static Reservoir Model | | | | | |
| Reservoir Engineering | | Fluid characteristics, Dynamic Reservoir Model | | | | | |
| Petroleum Technol. | | Well design/ performance | | | | | |
| PDO SUPPORT TEAM | | | | | | | |
| Yann Bigno | OQP11 | Reservoir Engineering | | | | | |
| Fahad al | OQP21 | Geology, Static Reservoir Model, Project Coordination | | | | | |
| Eilard H Strating | OQP21 | Seismology/structural geology | | | | | |
| Sanni Modiu | OQP41 | Petrophysics | | | | | |
| Oscar vanRavesteijn | OQP52 | Production Technology | | | | | |
| Andy Vincent | OQE51 | Conceptual Engineering | | | | | |
| SCHEDULE | | | | | | | |
| Estimated completion date Q1 2002 (very dependent on availability of manpower). See attached bar chart. | | | | | | | |
| AGREED BY | OQP | OQP/1 | OQP/2 | OQP/3 | OQP/4 | OQP/5 | OQE |
| Date: | | | | | | | |

Detailed Description of Work Required

| Resource | Work Specifications | Man Days |
|---|--|---------------------------|
| PS OQP 21 | <u>Shuaiba Reservoir ONLY</u> 1. Synthetic seismic 2. If indicated application of seismic filters to increase data quality 3. Seismic Inversion using Jason workbench (stochastic) 4. Horizon interpretation (in time and depth) 5. Mapping of seismic facies using StratiMagic or a similar attribute analysis system 6. Transfer of data to GEOCAP 7. Reporting | AS per Attached Bar Chart |
| PP OQP 41 | <u>Shuaiba Reservoir ONLY</u> 1. Review all available Petrophysical wireline data, addressing: <ul style="list-style-type: none"> • porosity. • Permeability. • Facie dependent k/phi relationships. • Facies dependent hydrocarbon saturation & fluid contacts utilizing RFTs/logs. • Uncertainty analysis. 2. Saturation Height Function 3. Provide a set of capillary curves as appropriate for the different phases to be incorporated in MoReS runs. 4. Documentation of Petrophysical issues. | AS per Attached Bar Chart |
| Structural OQP 21 & Schlumberger | <u>Shuaiba Reservoir ONLY</u> 1. Fault interpretation from seismic using advanced visualization techniques 2. Fracture analysis from cores and logs 3. Fracture modeling using advanced modeling techniques 4. Data transfer to GEOCAP/MoRes 5. Reporting | AS per Attached Bar Chart |
| RG OQP21 | <u>Static Model – Full field Area Natih E and Shuaiba</u> 1. Project Coordination 2. Analysis of the pore network, phi/k and capillary characteristics of the reservoir rock using core and thinsection data. 3. Analysis of FMI data 4. Integrate all seismic, structural, core and log data (incl FMI) from AG Shuaiba Field 5. Integrate results Natih E interference test in AG Natih E 3D "GEOCAP" model 6. Provide a 3D "GEOCAP" model for the AG Shuaiba. (facies and properties) 7. Calculate Shuaiba STOIP. 8. Iterate static models to achieve history match 9. Assess uncertainties inherent in the static models. 10. Document geological and static model. | AS per Attached Bar Chart |
| RE OQP11 | <u>Simulation – Full field Area Natih E and Shuaiba</u> 1. Prepare input data for MoReS models: <ul style="list-style-type: none"> • PVT data • relative permeability curves – incorporate analogous SCAL results/Hysteresis • Incorporate capillary pressure curves • set-up production history files • set-up well parameters data, incorporating Trajectory files from OQP/21 • set-up well constraint definitions (with OQP/51) 1. Reduce 3D GEOCAP models 2. QC the Reduced models and check HCIP in conjunction 3. Perform simulation history matches. 4. Run forecast for Full Field models. <u>Economic Evaluation</u> <u>Reporting</u> 1. Contribute to the final report 2. Issue Reserves Note | AS per Attached Bar Chart |
| PT OQP/51 | 1. Well designs/cost and performances. 2. Co-ordination with surface Eng.s(..i.e. Pressure requirements). 3. Documentation of PT related issues. | AS per Attached Bar Chart |

| DRAFT TERMS OF REFERENCE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|--|-------------------------------------|---|-------|-------|---|-----|-----|-----|----------------|-----|--|-------------------------------|----|--|--------------------------------------|----|------------------------|--------------------------|-----|--|--------------------------------|---|--|-----|-----|--|-----------|-----|--|-----------------------|---|--|-------------------------------|-----|--|---------------------------|-----|--|
| Field: Project Type: Project Name: | Ghaba North SHUAIBA Field Development Plan Update Ghaba North GOGD FDP Update | | | | | | Revision No: 0 Proposed By: OQP21 Month: Sep 2001 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| OBJECTIVES OF STUDY | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Update the 3D geological and dynamic model for the Ghaba North Field, based on the results of the Q3 2002 appraisal well. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CURRENT STATUS (1.03 ARPR) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ghaba North Shuaiba (10^6 m^3) <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 40%;">STOIIP (total)</td> <td style="width: 10%; text-align: right;">118</td> <td style="width: 50%;"></td> </tr> <tr> <td>{STOIIP (crest - Sw=60% OWC):</td> <td style="text-align: right;">85</td> <td></td> </tr> <tr> <td>STOIIP (Sw=60% OWC - Sw = 100% OWC)]</td> <td style="text-align: right;">34</td> <td>DR: Developed Reserves</td> </tr> <tr> <td>UR (crest - Sw=60% OWC):</td> <td style="text-align: right;">5.4</td> <td></td> </tr> <tr> <td>UR (Sw=60% OWC - Sw=100% OWC):</td> <td style="text-align: right;">0</td> <td></td> </tr> <tr> <td>DR:</td> <td style="text-align: right;">2.4</td> <td></td> </tr> <tr> <td>Cum Prod:</td> <td style="text-align: right;">2.3</td> <td></td> </tr> <tr> <td>Undeveloped Reserves:</td> <td style="text-align: right;">3</td> <td></td> </tr> <tr> <td>Discounted cSFR(matrix dvpt):</td> <td style="text-align: right;">2.5</td> <td></td> </tr> <tr> <td>Discounted cSFR(GOGD+TE):</td> <td style="text-align: right;">4.6</td> <td></td> </tr> </table> | | | | | | | | | | | STOIIP (total) | 118 | | {STOIIP (crest - Sw=60% OWC): | 85 | | STOIIP (Sw=60% OWC - Sw = 100% OWC)] | 34 | DR: Developed Reserves | UR (crest - Sw=60% OWC): | 5.4 | | UR (Sw=60% OWC - Sw=100% OWC): | 0 | | DR: | 2.4 | | Cum Prod: | 2.3 | | Undeveloped Reserves: | 3 | | Discounted cSFR(matrix dvpt): | 2.5 | | Discounted cSFR(GOGD+TE): | 4.6 | |
| STOIIP (total) | 118 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| {STOIIP (crest - Sw=60% OWC): | 85 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| STOIIP (Sw=60% OWC - Sw = 100% OWC)] | 34 | DR: Developed Reserves | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UR (crest - Sw=60% OWC): | 5.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| UR (Sw=60% OWC - Sw=100% OWC): | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DR: | 2.4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Cum Prod: | 2.3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Undeveloped Reserves: | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Discounted cSFR(matrix dvpt): | 2.5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Discounted cSFR(GOGD+TE): | 4.6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| No. of reservoirs: 1 | | | | No. of currently completed wells: 13 vertical, 2 horizontal (GN25/26) Total wells number: 30, Penetrated Shuaiba 27, producing 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| BACKGROUND NOTES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>The Shuaiba fractured carbonate reservoir in the Ghaba North Field, is the subject of a PDO Geosolutions study aimed at delivering both a static and dynamic reservoir model. At present the study is close to completing the static reservoir model which incorporates state-of-the art fracture models and sophisticated seismic and stratigraphic modelling techniques.</p> <p>The present work has already highlighted the potential relationship between reservoir layering and fracture distribution. Current well coverage, however, does not allow to fully pin down these relationships. To this end, an appraisal/production well is scheduled in Q2/3 2002.</p> <p>The aim of this study is to incorporate the results of this appraisal well and to update the static and dynamic reservoir models accordingly.</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| WORK REQUIRED | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| See tables below for detailed description of work required per discipline. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DELIVERABLES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1. Interpretation of the appraisal well data 2. Update the 3D static reservoir model. 3. Update the Full field dynamic model. 4. Multiple scenario evaluation to account for geological, dynamic and development uncertainties. 5. Updated reserves estimate. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| MANPOWER AND TIME ESTIMATES | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <i>Person</i> | <i>Indicator</i> | <i>Responsibility</i> | <i>Man-weeks (net)</i> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SEPTAR TEAM: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Petrophysics | | Log interpretation-correlation, Phi-K-So relations, reservoir param. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Geology | | Core description, Pore Network Classification and FMI analysis | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Schlumberger | | Fracture picking, analysis and consultant | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Structural Geology | | Regional Structural Evaluation: Fault and Fracture interpretation | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Geology | | Static Reservoir Model | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Reservoir Engineering | | Fluid characteristics, Dynamic Reservoir Model | As Per Attached Work Plan - Time | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Petroleum Technol. | | Well design/ performance | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| PDO SUPPORT TEAM | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Volker Vahrenkamp | | Reservoir Geology, Consultant on 3D static model | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Yann Bigno | XGL1 | Reservoir Engineering | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Mehedi Hossaini | OQP11 | Reservoir Modeling – Dynamic Consultant. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fahad al | XGR1 | Geology, Static Reservoir Model, Project Coordination | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Eilard H Strating | OQP21 | Seismology/structural geology | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sanni Modiu | OQP21 | Petrophysics | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Oscar vanRavesteijn | OQP41 | Production Technology | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Andy Vincent | OQP52 | Conceptual Engineering | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | OQE51 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SCHEDULE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Estimated completion date end Q4 2002. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AGREED BY | OQP | OQP/1 | OQP/2 | OQP/3 | OQP/4 | OQP/5 | OQE | XGM | XGR | XGL | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Date: | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

Detailed Description of Work Required

| Resource | Work Specifications | Man Days |
|--|---|---------------------------|
| PP OQP 41 | <u>Shuaiba Reservoir ONLY</u> 1. Update Petrophysical wireline data, saturation hight functions and capillary curves. | AS per Attached Bar Chart |
| RG Frac SEPTAR & Schlumberger | 1. Update fracture model using new fracture analysis from cores and logs (if available) 2. Data transfer to GEOCAP/MoRes 3. Reporting | AS per Attached Bar Chart |
| RG OQP21 | <u>Static Model – Full field Area</u> 1. Project Coordination 2. Update 3D "GEOCAP" model 3. Iterate static models to achieve history match 4. Assess uncertainties inherent in the static models. 5. Document geological and static model. | AS per Attached Bar Chart |
| RE OQP11 | <u>Simulation – Full field Area</u> 1. Update input data for MoReS models 2. Reduce 3D GEOCAP models 3. QC the Reduced models 4. Perform simulation history matches. 5. Run forecast for Full Field models. <u>Economic Evaluation</u> <u>Reporting</u> 1. Contribute to the final report 2. Issue Reserves Note | AS per Attached Bar Chart |
| PT OQP/51 | 1. Well designs/cost and performances. 2. Co-ordination with surface Eng.s(,i.e. Pressure requirements). 3. Documentation of PT related issues. | AS per Attached Bar Chart |

| TERMS OF REFERENCE | | | | | | | | | | | | | |
|--|--|-------|-------|-----------|-------------|-----------|-------------|--------|------|------|-----|------|------|
| Draft 2 | | | | | | | | | | | | | |
| Title: Field Update and Performance Review of Nimr G | | | | | | | | | | | | | |
| Updated: Sept 29 th , 2001 | | | | | | | | | | | | | |
| Purpose of Study. | | | | | | | | | | | | | |
| To locate and evaluate remaining and scope oil over the Nimr-G catchment area and validate the current development strategy in view of the performance of wells drilled up to the end of 2001. Provide the development team with a validated and reliable set of models upon which to base further drilling activity. Update and validate the scope oil and its location. | | | | | | | | | | | | | |
| Scope. | | | | | | | | | | | | | |
| <ul style="list-style-type: none"> Multi-disciplinary field review (PS, PG, PP, RE, PT) resulting in the construction of static and dynamic models. The study will comprise re-evaluation of the seismic interpretation, a review of the geological framework, a review of the performance of the currently producing wells (inflow & outflow), a re-evaluation of the reservoir engineering parameters such as PVT, relperms, pressure performance and a petrophysical analysis for static and dynamic modeling. | | | | | | | | | | | | | |
| Deliverables. | | | | | | | | | | | | | |
| <ul style="list-style-type: none"> Updated structure and reservoir maps Well performance maps Surveillance/data acquisition plan Optimisation plan | <ul style="list-style-type: none"> Static and Dynamic Models Future drainage locations and their production potential Field Development Plan Update Reserves and Scope Update | | | | | | | | | | | | |
| Current Status (1.1.2001 ARPR, oil, mln m3). Expectation Values | | | | | | | | | | | | | |
| | <table border="1"> <thead> <tr> <th></th> <th>STOHP</th> <th>UR</th> <th>Np</th> <th>Dvdp Res.</th> <th>Undev. Res.</th> </tr> </thead> <tbody> <tr> <td>G Area</td> <td>57.4</td> <td>16.0</td> <td>6.3</td> <td>2.97</td> <td>6.72</td> </tr> </tbody> </table> | | STOHP | UR | Np | Dvdp Res. | Undev. Res. | G Area | 57.4 | 16.0 | 6.3 | 2.97 | 6.72 |
| | STOHP | UR | Np | Dvdp Res. | Undev. Res. | | | | | | | | |
| G Area | 57.4 | 16.0 | 6.3 | 2.97 | 6.72 | | | | | | | | |
| Nimr G is currently producing some 1830 m3/d of oil with 88% water cut. | | | | | | | | | | | | | |
| Background notes. | | | | | | | | | | | | | |
| The field consists of three reservoir units that form one hydrocarbon system. There are 55 wells of which 51 are active. Last field review was performed in 1998, which resulted in an upwards reserves revision (from 10.6 UR). By end 2001, 15 wells will have been drilled since the '98 review, including 3 multilaterals. 2001 sees the start of the infill drilling in Nimr-G. The performance of all of the wells needs to be reviewed against the expectation when the plans were developed. There is a large low column area to the north of the field that may contain difficult low n/g reservoir units. This area needs to be incorporated into the field models (and scope figures) and a strategy of addressing the potential reserves needs to be developed. The AOI of the study should include data from the Deep Water Disposal wells and the western flank of the Nimr A field. | | | | | | | | | | | | | |
| Study Focal Point. | | | | | | | | | | | | | |
| To be decided | | | | | | | | | | | | | |
| Resources. — indicative only | | | | | | | | | | | | | |
| Seismologist — 3 man-months Geologist — 4 man-months Petrophysicist — 0.5 man-months Reservoir Engineer — 4 man-months Production Technologist — 1.5 man-months | | | | | | | | | | | | | |
| Other resource / data budget requirements. | | | | | | | | | | | | | |
| Activities. | | | | | | | | | | | | | |
| <ul style="list-style-type: none"> Seismic reprocessing, horizon and fault interpretation Petrophysical evaluation and geological correlation Structure maps, isochore maps, reservoir distribution maps (top Natih c, top Nahr Umr, base Nahr Umr, base Al Khata P1, top Al Khata P5, top Al Khata P9, top Amin) Field performance review | <ul style="list-style-type: none"> Geological model construction Dynamic modeling and history matching (sectors or full-field). Development Options for reserves and scope (remaining oil saturation, water shut-off options, infill drilling locations etc) Reporting | | | | | | | | | | | | |
| Precedence diagram. | | | | | | | | | | | | | |
| To be developed | | | | | | | | | | | | | |
| Critical path and risks. | | | | | | | | | | | | | |
| None yet identified | | | | | | | | | | | | | |
| Drivers | | | | | | | | | | | | | |
| 13 wells to be drilled in 2002 | | | | | | | | | | | | | |
| Quality Plan. | | | | | | | | | | | | | |
| Agreed by: | | | | | | | | | | | | | |
| OMP | OMP/1 | OMP/2 | OMP/4 | OMP/5 | | | | | | | | | |

| TERMS OF REFERENCE | | | | |
|--|-------|--|----------|-------------|
| | | | | Version 1b |
| Title: Nimr C FDP Revision | | | | |
| Report no: ONM?/xxx/2001 | | Date: Sept. 29 th , 2001 | | |
| Purpose of study. | | | | |
| To generate a revised FDP for the further development of the Nimr-C field which is currently on hold awaiting this review. | | | | |
| Scope. | | | | |
| PHASE I – Update the previous static model work and gain team familiarisation (Tollgate 1) <ul style="list-style-type: none"> Review petrophysical parameters used in the previous models and seek an improvement if possible (PP). Review the current seismic model and incorporate the seismic acquired in 2001 (if available). Extend the seismic interpretation to cover the eastern and western extensions of the field. Review the previous GeoCap models to seek an improvement which may be desirable. Enlarge the model to include the areas covered by the revised seismic interpretation. (PG). | | | | |
| PHASE II – Regenerate static and dynamic model and History match (Tollgate 2) <ul style="list-style-type: none"> Re-generate GeoCap models of different realizations to be iteratively tested in the dynamic model. (PG). Re-build MoReS model(s) and history match (RE). | | | | |
| PHASE III – Generate field development plan (Tollgate 3) <ul style="list-style-type: none"> Use history matched model to test possible development options, and define optimum development plan. Identify future new well locations, producers and injectors as appropriate. Develop recommendations on well completions. Develop economics to support recommended way forward. | | | | |
| Deliverables. | | | | |
| <ul style="list-style-type: none"> Updated structure and reservoir maps Well performance maps Surveillance/data acquisition plan Optimisation plan | | <ul style="list-style-type: none"> Static and Dynamic Models Future drainage locations and their production potential Field Development Plan Update Reserves and Scope Update | | |
| Current Status (According to PB2001, oil, mln m3). | | | | |
| STOIIP | UR | Np | Dvdp Res | Undev. Res. |
| 56.52 | 10.03 | 7.0 | 1.9 | 1.13 |
| The field net oil production is 1023 m3/d at 81 % water cut. | | | | |
| Background notes. | | | | |
| A detailed or complex geological model (description) was delivered in Feb. 2000 by SEPTAR. The dynamic model generated from the geological model has not been able to be history matched in the 2000 study. The field comprises mainly of two stacked reservoirs that are in indirect communication created by fault offsets. The currently perceived options for further field development are; waterflood (either downflank or patterned infill), targeted updip infill or no further activity. | | | | |
| Study Focal Point. | | | | |
| James Sheng (ONP17G) | | | | |
| Resources – indicative only | | | | |
| Seismologist – 3 man-months | | | | |
| Geologist – 2 man-months | | | | |
| Petrophysicist – 0.5 man-months | | | | |
| Reservoir Engineer – 5 man-months | | | | |
| Production Technologist – 2 man-months | | | | |
| Other resource / data / budget requirements. | | | | |
| The discussion with the previous 1999 SEPTAR team will be helpful. | | | | |
| Activities. | | | | |
| <ul style="list-style-type: none"> Validation of the existing seismic interpretation and extension to the flank areas. Incorporate last wells in Petrophysical evaluation Extend structure maps to include entire Gharif rim and area covered by new seismic. Produce structure maps, isochore maps, reservoir distribution maps (top Natih e, top | | Nahr Umr, base Nahr Umr, Mid Gharif 4 Lower Gharif 2 top Rahab and any other identified reservoirs. <ul style="list-style-type: none"> Update geocap model as necessary Dynamic modeling and history matching (sectors or full-field). Carry out material balance analysis. Identify and economically test future development options. Identify any scope volumes Review sand control/completion policy in the field. | | |
| Precedence diagram. | | | | |
| Gantt chart to be worked out. | | | | |

| | | | | | |
|---|------------|--------------|--------------|--------------|--------------|
| Critical path and risks. | | | | | |
| The production history needs to be matched in the simulation model(s). | | | | | |
| Quality Plan. | | | | | |
| Milestones/technical reviews: Three tollgates as defined in the Scope. | | | | | |
| Agreed by: | | | | | |
| | | | | | |
| AGREED BY | ONP | ONP/1 | ONP/2 | ONP/4 | ONP/5 |
| | | | | | |

Milestone meetings:

| Milestone | Planned date | Actual date |
|--|------------------|-------------|
| Tollgate 1- Update the status of the previous work | To be worked out | |
| Tollgate 2 – History matching | To be worked out | |
| Tollgate 3 – FDP | To be worked out | |

| TERMS OF REFERENCE | | | | | |
|---|------|-------------------------------------|----------|-------------|------------|
| | | | | | Version 1b |
| Title: Marmul Al Khlata SE A & B IPES | | | | | |
| Report no: OMM?/xxx/2001 | | Date: Sept. 29 th , 2001 | | | |
| Purpose of study. | | | | | |
| To build static and dynamic model for the South East (A & B) Area of the Marmul Al Khlata field to 1) support further development of the area based on water-flooding and 2) develop a scope maturation plan for 2.2 mln m3 cSFR and 4.9 mln m3 mSFR. | | | | | |
| Scope. | | | | | |
| <ul style="list-style-type: none"> Build 3D reservoir geological model & upscale into dynamic model Review historical performance & undertake material balance. History match including feedback of required changes to geological model as/if required. Study alternate development scenarios (e.g. water flood) including possible synergy with other areas of the field (e.g. South Central Valley) Formulate development plan and generate production forecast. Estimate STOIP and reserves and document Reserves NFF (if applicable). Undertake internal reviews OMP, UPR. | | | | | |
| Deliverables. | | | | | |
| <ol style="list-style-type: none"> 1. Geocap model of the South East Area sector 2. PP review of por-perm relationship & saturation height function 3. Dynamic model(s), in line with the Geocap model(s) 4. SE Area Field Development Plan, including scope maturation | | | | | |
| Current Status (According to PB2001, oil, mln m3). | | | | | |
| STOIP | UR | Np | Dvpd Res | Undev. Res. | |
| 46.0 | 13.0 | 6.6 | 1.6 | 4.8 | |
| The field net oil production is 1023 m3/d at 81 % water cut. | | | | | |
| Background notes. | | | | | |
| <p>The South East A & B areas of the Marmul Al-Khlata reservoir have been developed over time by a total of 38 wells completed in the Al Khlata-P9 interval, 16 of which are horizontal. A vertical polymer injection trial was carried out in this area which was not very successful. Oil production from most of the flank wells was reasonably high due to the medium natural aquifer support on the edge of the area but wells far away from the flanks are less prolific. Current production from the area is some 700 m3/d oil at ~88% BS&W. This constitutes some 22% of the net total production from Marmul Al-Khlata. Only 18% of STOIP in the SE Area is currently developed. No development is currently being carried out in this area, but the plan is to continue development of the area by horizontal pattern water flood from 2002 when seven wells will be drilled in the SE-B area. Horizontal water flooding in Al Khlata reservoir has proven to be successful in the North and South Central Valley of the field. To evaluate the feasibility of such an approach in the thinner Al Khlata of the SE Areas and to define a field redevelopment plan for the waterflood scenario, an integrated field study is needed. This will determine; the geological model (mainly sand body connectivity), the reservoir properties, the dynamic reservoir behaviour and devise a completion policy and water supply strategy for the field. Commercial SFR of some 2.2 mln m3 to achieve recovery factor of 33% from waterflood development is currently estimated for this area. Some additional 4.9 mln m3 of marginal SFR is currently estimated to be recoverable from polymer injection. This study is primarily to address the waterflood development of the undeveloped reserves and furthermore to develop a scope maturation plan for the 2.2 mln m3 of commercial SFR (estimated) and the 4.9 mln m3 of marginal SFR (estimated) in this area.</p> | | | | | |
| References: | | | | | |
| <ol style="list-style-type: none"> 1. NFF BDM/179/96 Marmul Field Al-Khlata SE Area 1996 Performance Review & Subsurface Development Plan 2. NFF OMM/094/99 Marmul Field Al-Khlata STOIP and Reserves Review for 1.1.2000 ARPR | | | | | |
| Study Focal Point. | | | | | |
| Suleiman Al-Mantheri (OMP/54) | | | | | |
| Resources – indicative only | | | | | |
| Other resource / data / budget requirements. | | | | | |
| Activities. | | | | | |
| <ul style="list-style-type: none"> | | | | | |
| Precedence diagram. | | | | | |
| Gantt chart to be worked out. | | | | | |
| Critical path and risks. | | | | | |
| The production history needs to be matched in the simulation model(s). | | | | | |
| Quality Plan. | | | | | |
| Milestones/technical reviews: Three tollgates as defined in the Scope. | | | | | |
| Agreed by: | | | | | |
| AGREED BY | OMP | OMP/1 | OMP/2 | OMP/4 | OMP/5 |

Milestone meetings:

| Milestone | Planned date | Actual date |
|--|------------------|-------------|
| Tollgate 1- Static model review | To be worked out | |
| Tollgate 2 – History matching | To be worked out | |
| Tollgate 3 – Final dynamic model and FDP | To be worked out | |

TERMS OF REFERENCE

Terms of Reference: Birba

Report no: ????

Date: 6-Feb-07

Purpose of study.

Field Development Plan for the Birba field

Scope.

Presently (in 2001) an integrated Petroleum Engineering field study is being carried out by EPT-AGI that takes into account essential changes in the geological model. The study proposed in this document is a follow-up to the 2001 study.

The exact scope of the study needs to be firmed up with EPT-AGI at the tollgate meeting planned in the week October 13-17, 2001, but will most probably consist of an integrated Petroleum Engineering Review including updates of static and dynamic model. It is expected that there will remain significant uncertainties in the following two areas:

1. The precise PVT behaviour (miscibility/non-miscibility of the injected gas; loss of UR due to not maintaining pressure);
2. The precise flow mechanism and individual contributions of flow units.

These uncertainties need to be addressed in order to develop robust field development options. Further data gathering and scenario modelling is required to further reduce these uncertainties. For the first uncertainty (the PVT behaviour) the use of EOS modelling may be necessary.

Deliverables.

FDP update, updated static and dynamic model

Current Status (1.1.2001 ARPR, oil, mln m3).

| | STOIIP | UR | Np | Dvdp Res | Undev. Res |
|-----------|--------|-------|------|----------|------------|
| Birba A4C | 31.20 | 11.49 | 4.17 | 7.32 | 0 |

The Birba wells currently produce 900 m3/d dry oil from 3 wells.

Background notes.

The Birba field, which is on production since 1982, is being developed with gas injection since 1993. The Birba carbonate stringer is well known to have peculiar PVT properties including strong compositional grading and a GOC without a discontinuity in fluid composition.

Due to compressor problems, voidage replacement by gas injection has only partly been adhered to. This has resulted in a drop in reservoir pressure from 53 MPa to 41 Mpa, which probably has an impact on UR. As reduction presently takes place well below (initial) bubble point pressure and the GOR of the producing wells is going up, a thorough review of development options is required.

Study Focal Point.

Hans Kraaijevanger (OMP/11)

Resources.

Tentative estimate is as follows:

| | |
|-------------------------|-----------|
| Reservoir Engineer | (90 days) |
| Geologist | (45 days) |
| Petrophysicist | (30 days) |
| Production Technologist | (30 days) |

Other resource / data budget requirements.

None

Activities.

Update of full field GEOCAP model

Full review of petrophysical data leading to improved estimates of NTG, porosity and saturation.

Full analysis of all available PVT data taking into account severe compositional grading.

Build new lift curves for all wells.

Build or update dynamic model incorporating accurate PVT description.

Reservoir simulation (History match and development scenarios)

FDP update including a data gathering and reservoir management plan

Precedence diagram.

None

Critical path and risks.

- Sufficient data to do a full PVT analysis
- Complexity of the field (highly faulted carbonate, compositional grading)

Quality Plan.**Milestones**

- Improved petrophysical parameters and updated static model (GEOCAP)
- Analysis of all PVT data and incorporation into dynamic model
- Review of history match
- Review of FDP
- NFF documentation

Agreed by:

AGREED BY

OMP

OMP/1

OMP/2

OMP/4

OMP/5

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| | | | | | | | |
|---|--|--|--|--------------|--------------|--------------|------------|
| Field: Project Type: Project Name: | Amin Study and Field Development Plan | Revision No: Proposed By: Month: | 1 OMP/15 Oct 2001 | | | | |
| OBJECTIVES OF STUDY | | | | | | | |
| <ol style="list-style-type: none"> 1. Reserves review and update of all Amin areas but with main focus on Areas-1 and 3. 2. Study of static and current dynamic behaviour of the reservoir. 3. Update Amin's FDP. 4. Exploit possibilities of other development scenarios (water injection, closer infill, EOR). | | | | | | | |
| CURRENT STATUS (1.1.2001 ARPR) | | | | | | | |
| Amin (10^6 m^3) STOIIP: 202.05 UR: 31.954 Developed Reserves: 8.37 Cum Prod: 8.66 Undeveloped Reserves: 14.95 cSFR: 4.66 | | <ul style="list-style-type: none"> ➤ Base Nahr Umr map has been updated to AN-82 ➤ Seismic line reprocessed shows significant improvement ➤ Fairly comprehensive set of Static and RFT pressure data ➤ Petrophysical logs on AN-1 to 40, AN-66, 67, 68 and 70. ➤ Core data for AN-4, 10, 12 & 14. 18 vertical penetrations ➤ PVT reports on AN-3 and AN-8. ➤ Geochemistry and petrographical reports. | | | | | |
| BACKGROUND NOTES | | | | | | | |
| <p>The Amin field is a large low relief, dip closed structure divided into two accumulations (Eastern and Western highs) separated by a saddle. The oil and reservoir quality in the Western High are by far better than in the Eastern High. The average oil column height in the Western High of the field is 60 m, while in the Eastern High it is less than 25 m. The oil viscosity in the Western High has an average value of 400 mPa.s, while it about 1000 mPa.s in the Eastern accumulation. The Western High is split into 5 different Areas on the basis of reservoir and fluid properties. The Amin field is producing under a natural depletion drive with pressure support for an aquifer underlying the reservoir.</p> <p>Currently 82 wells have been drilled in the field, of which 76 are on production, 3 closed-in and 3 abandoned/renamed. In Amin there are 3 vertical wells, 29 horizontal wells and 49 dual lateral wells. Area-1 currently produces approx. 4400 m³/d oil with a BS&W of 69% from 68 wells. The remainder of the field produces approx. 235 m³/d oil from 12 wells.</p> <p>Wells drilled during 1999 to 2001 have under-performed against prediction both in terms of initial oil rate and their subsequent decline. This applies both to the primary and infill locations. There are a number of factors that could be playing a role e.g. reservoir pressure decline, presence of laterally extensive impermeable streaks, multi-lateral design, BS&W development. Also an investigation into the likely causes is required on a well type basis to identify possible preventive measures. This decline in reservoir performance could lead to a reserve de-booking of about 3.80 mln m³ in Area-1 and a possible de-booking in Area-3 too.</p> <p>The latest FDP for the field was completed in 1999 where the field development was based on drilling dual-lateral horizontal wells. The field development in terms of well spacing and booked reserves was based on simulation of sector models over Area-1 and 3. In mid 2000, drilling of dual-laterals has ceased due to difficulty in drilling these wells. The shift from dual-lateral wells to single horizontals has also aggravated the possible de-booking.</p> | | | | | | | |
| WORK REQUIRED | | | | | | | |
| <ul style="list-style-type: none"> - Extra data acquisition (Pilot holes, fluid samples, downhole flow metering)- PDO - Seismic reprocessing- PDO - Seismic re-interpretation to update structure and fault maps. - Full field petrophysical evaluation - Geocap model for the whole field - Update of STOIIP and reserves - Dynamic full field or sector models for Areas-1 and 3. - Evaluation of well completion strategies | | | | | | | |
| DELIVERABLES | | | | | | | |
| <ol style="list-style-type: none"> 1. Full field Geocap model, all of Amin's Western Accumulation areas 2. Dynamic full field or sector models over Areas-1 and 3 3. Evaluate need to study reservoir dynamics and recovery from other Amin Areas (Areas-2, 4 and 5). 4. Updated STOIIP, reserves and SFR 5. Updated FDP | | | | | | | |
| MANPOWER AND TIME ESTIMATES | | | | | | | |
| Discipline | Man-days(net from) | | | | | | |
| Seismologist | 90 | | | | | | |
| Geologist | 90 | | | | | | |
| Petrophysist | 60 | | | | | | |
| Reservoir Engineer | 90 | | | | | | |
| Production technologist | 90 | | | | | | |
| Front-end Engineer | 10 | | | | | | |
| SCHEDULE AND MILESTONES | | | | | | | |
| See chart attached. | | | | | | | |
| AGREED BY | OMP | OMP/1 | OMP/2 | OMP/3 | OMP/4 | OMP/5 | OME |
| Date: | | | | | | | |

[illegible]

Terms of Reference: Karim West

Report no: ????

Date:6-Feb-07

Purpose of study.

Field Development Plan of Mahwis reservoir.

Scope.

Integrated Petroleum Engineering review involving building a detailed GEOCAP static model and MoReS reservoir simulation. The study will comprise geological and petrophysical reviews prior to simulation work. The study will concentrate on the feasibility of water injection in the Mahwis reservoir, and focuses on the design of the water injection scheme of the water injection pilot planned for 2002, depending on the study results.

Deliverables.

FDP update and water injection design for the pilot (if FDP proves the feasibility of water injection scheme)

Current Status (1.1.2001 ARPR, oil, mln m3).

| | STOIIP | UR | Np | Dvdp Res | Undev. Res |
|--------------|--------|-------|-------|----------|------------|
| Haima Mahwis | 47.81 | 8.95 | 4.83 | 2.26 | 1.86 |
| Al Khfata | 39.29 | 11.29 | 10.28 | 1.75 | 0 |
| Gharif | 3.07 | 0.76 | 0.36 | 0.05 | 0.35 |

The Haima Mahwis wells currently produce 900 m3/d net at 57 % water cut, from 26 wells.

Background notes.

The Karim West field forms a dome shaped structure at the base Nahe Umr. The field is divided by a major North-South fault into two development areas: Eastern Development Area (EDA) and Western Development Area (WDA). The EDA consists of AlKhfata P9 underlain by Haima Mahwis sands in the Southern part of the area, whereas the WDA consists of Haima Mahwis reservoir. The EDA is underlain by a large aquifer, and development of the area has been by horizontal wells. The WDA consists of Haima Mahwis reservoir, which comprises stacked fining upward sequences of fine-grained sandstones. Cement zones and clay layers of limited lateral extent serve as restriction to vertical flow. A major permeability barrier located about the OWC impedes aquifer support to the oil-bearing Mahwis. Hence, a rapid pressure depletion is observed in the oil zone, especially in the crestal area of the reservoir. The 1999 Mahwis full field simulation model identified high angle deviated wells as the way to develop the reservoir. KMW-62 (deviated well) was drilled early 2000, which did not perform quite as well as expected. Realizing water injection as the next phase of development of the reservoir, two vertical wells were drilled in Q2 2001 in the crest of the reservoir. The two wells are designed to have the option of converting them to water injectors to start a water injection pilot with two patterns of 5-spot pattern.

Study Focal Point.**Resources.**

| | |
|-------------------------|-----------|
| Reservoir Engineer | (60 days) |
| Geologist | (45 days) |
| Seismologist | (30 days) |
| Petrophysicist | (30 days) |
| Production Technologist | (60 days) |
| Front-End Engineer | (10 days) |

Other resource / data budget requirements.

None

Activities.

Geological review and full field GEOCAP model for WDA (Mahwis)
 Review saturation height relationship and define parameters for volumetric calculations
 Sector reservoir simulation of the water injection pilot area (History match and development scenarios)
 FDP update for the WDA
 Water injection options and design of the pilot

Precedence diagram.

None

Critical path and risks.

- Adequately capturing the shale distribution and layering in the WDA simulation work
- History matching RFT data is a key to capture the transmissibility of shale layers

Quality Plan.**Milestones**

- Correlation review and GEOCAP Mahwis model
- Review of history match
- Review of Mahwis FDP
- NFF documentation

Agreed by:

AGREED BY ONP ONP/1 ONP/2 ONP/4 ONP/5

Marmul Asset (RTQ Area)

T50 Rahab Field Steam Soak Opportunity

Summary

The purpose of this note is to initiate the Rahab steam opportunity – a T50 target. By approving this initiative the first phase of the study work will be kicked off; this consists of a StepTar screening study followed by a VAR1 at the end of the year or early next year. The Studies budget is being updated with \$350,000 to cover this phase. Assuming success the studies would continue into 2002 and on towards a reserves booking in 2003. Some \$500,000 has been earmarked in the studies budget for 2002.

Scope of Study

This proposal presents a case for pursuing a Thermal Recovery Project (Steam soak pilot followed by steam flood) of the Middle and Lower 1 Gharif Reservoirs in Rahab Field of the Marmul asset. The field has been the subject of a steam soak trial in 1986-1987, and data is available.

The STOIP targeted in the Middle Gharif and Lower Gharif 1 reservoirs is 42 mln m³. Current reservoir pressure in the field is mostly below 3,000kPa. The interval of interest has good quality reservoir, that is 30-45 m thick in two main sand bodies, with permeability >300 mD and 28% av. porosity. Furthermore, the area of interest is a relatively compact area.

The potential gain from pursuing this work is conversion of the currently envisaged discounted SFR volume of 8.4 mln m³ to reserves (16.8 mln m³ with 0.50 POS)

Previous Discussions

PDO has recently launched an initiative (Target 50) to identify fields where there is an opportunity to raise the recovery factor to 50%, using amongst other processes thermal recovery. The Rahab field was identified earlier this year by a "quick hit" team from SEPTAR as a candidate for steam recovery. Currently PDO has no full time staff available to carry out a screening study on this project. At best, ad hoc advise on reservoir engineering and production technology is available.

Results of the most recent discussion held between Marmul and SepTar staff have identified the need for the following manpower if we are to move this project forward to an equivalent VAR1 level.

Manpower

| Consultants Required | Time | Estimated Cost (US\$) | Scope of Work |
|---|------------|-----------------------|---|
| 1 Production Geologist | 1.5 months | 46,800 | Refine available GEOCAP model for thermal-scale modelling |
| 1 Reservoir Engineer (Project Co-ordinator) | 1.5 months | 46,800 | Construct simulation models for thermal recovery processes |
| 1 Production Technologist | 1.5 months | 46,800 | Completion design concept, interface with surface engineering |
| 1 Surface/Concept Engineer | 1.5 months | 46,800 | Design of steam generation and processing facilities |
| 1 Technical Support Staff | 1.5 months | 23,400 | Technical Support |
| 1 visit by SEPTAR Team | | 52,200 | Project discussions |
| 1 visit by PDO Team | | 25,000 | Project discussions |
| SEPTAR Consultant | | 29,000 | VAR1 Workshop |
| Estimated Total Costs | | 316,800 | |

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TERMS OF REFERENCE

| | | | |
|---------------|-------------------------------------|--------------|-------------------|
| Field: | AI Huwaisah | Revision No: | 1 |
| Project Type: | FDP and V2V Scope Maturation | Proposed By: | OYP/2 |
| Project Name: | AH T50 | Month: | April 2001 |

OBJECTIVES OF STUDY

1. Prepare field development plans for exploiting the ca. 16 MMm3 of reserves booked in 1999 (ref. 1) and 2000 (ref. 2)
2. Develop maturation plan for the scope volumes (ca. 21 MMm3) identified during the 2000 AI Huwaisah V2V peer assist.

CURRENT STATUS (1.1.2001 ARPR)

| | | |
|-----------------------|-----|------|
| AI Huwaisah | | |
| STOIIP: | 245 | MMm3 |
| UR: | 69 | MMm3 |
| DR: | 10 | MMm3 |
| Cum Prod: | 39 | MMm3 |
| Undeveloped Reserves: | 20 | MMm3 |
| cSFR: | 21 | MMm3 |

No. of reservoirs: 1 (deeper prospects may exist)

No. of currently completed wells: ca. 90

BACKGROUND NOTES

The billion barrel AI Huwaisah field (STOIIP: 245 MMm3) produces from the Cretaceous Shuaiba formation. In the AI Huwaisah area, the Shuaiba formation consists of Rudists reef deposits resulting in a complex depositional architecture. Faulting and fracturing are believed to be minimal.

Booked reserves in the AI Huwaisah field are currently 69 MMm3, resulting in a booked recovery factor of 28 %. Of these volumes, 39 MMm3 have been produced, leaving 10 MMm3 of developed and 20 MMm3 of undeveloped reserves. The undeveloped reserves result mainly from 2 reserves bookings in 1999 and 2001 (ref. 1 and ref. 2) during which notional development scenarios were suggested based on integrated static and dynamic modelling. However, these development scenarios are based on the introduction of water injection in the field. During a V2V peer assist that took place in June 2000, ca. 21 MMm3 of additional scope volume has been identified, and a scope maturation plan has been put in place. However, this plan has been put on hold due to lack of manpower. During the "T50" peer assist, the AI Huwaisah project ranked as one of the top 3 opportunities.

To consolidate the 1999 and 2000 reserve bookings and to execute the V2V scope maturation plan, it is preferred to outsource initial reserves consolidation and scope maturation to SEPTAR. This should result in a confirmation of the proposed development options of the 1999 and 2000 reserve bookings (ref. 1 and ref. 2), and a validation of the scope opportunities identified during the 2000 V2V peer assist. It is expected that the results of this work will be available for PDO in September 2001. Costs associated with this study are expected to be 1.25 MMUS\$.

After evaluation of the resourcing options, it is recommended to start in PDO in September 2001 with a minimal team of 5 engineers (TL, PG, PP, RE and CE). This team should mature the SEPTAR study results into a development plan for the most attractive area in the AI Huwaisah field in time for incorporation in PB2003. Currently, the PG, RE and CE resources for this initial team are secured through XGR, XGL and OYM. The TL and PP position still need to be resourced. To handle the more difficult STOIIP and make investment in 2003 possible, the initial team should be built up to 8 engineers (TL, 2PG, 1 PP, 2RE, 1 PT, 1CE). Field development plans for the remaining areas of the AI Huwaisah field would be submitted to the 2002 October board meeting. To mature the 7 scope opportunities identified during the AI Huwaisah V2V peer assist, an additional PG and 2 REs will be required by July 2002 delivering implementation plans by February 2003 for PB2004.

If the original 5 man team cannot be expanded, the project can still progress but at a much slower pace. An FDP for the most promising area can still be delivered by February 2002. However, the FDPs for the other 2 areas cannot be worked up in parallel. This results in the deferral of an FDP for the third area to February 2003. In this situation, implementation plans for the V2V scope opportunities can not be expected before 2004.

References

1. 'AI Huwaisah Field: Shuaiba Main Area Reserves Revision for 1.1.2000 ARPR', J.W. van der Bok et al., PDO Note for File OYP/9812/1, November 1999.
2. 'AI Huwaisah Field: Southwest and Eastern Satellite Areas Reserves Revision for 01.01.2001 ARPR', T. Materna et al, PDO Report OYP/0006/01, December 2000.

WORK REQUIRED

1. Integrated subsurface and concept engineering study to consolidate 1999 and 2000 reserves booking (ref. 1 and ref. 2) and validate V2V scope opportunities.

DELIVERABLES

1. Confirmation of the preferred development options for the 20 MMm3 of undeveloped reserves – Aug 2001
2. Validation of the 21 MMm3 of scope volumes identified during the 2000 V2V peer assist – Aug 2001
3. FDP for the most attractive area in the AI Huwaisah field including booking of upside volumes – Feb 2002
4. FDPs for the other areas in the AI Huwaisah field including booking of upside volumes – Aug 2002
5. Maturation of the scope opportunities identified during the V2V peer assists resulting in reserves bookings (21 MMm3) – Feb 2003

MANPOWER AND TIME ESTIMATES

| Person | Indicator | Responsibility | Timing |
|--------------------------|-----------|---|---------------------|
| SEPTAR | | | |
| Team Leader | SEPTAR | Co-ordinate integrated petroleum engineering study team and assist technically where required. Evaluate modelling approach. | May 2001 – Aug 2001 |
| Carbonate geologist | SEPTAR | Validate existing 3D static models and analyse subsurface uncertainty. | May 2001 – Aug 2001 |
| Carbonate geologist | SEPTAR | Examine scope opportunities identified during the V2V peer assist and analyse subsurface uncertainty. | May 2001 – Aug 2001 |
| Carbonate petrophysicist | SEPTAR | Validate existing petrophysical models and analyse subsurface uncertainty. | May 2001 – Aug 2001 |

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| | | | |
|---|--------|---|---------------------|
| Reservoir engineer | SEPTAR | Validate existing dynamic models and analyse subsurface uncertainty. Evaluate development options and confirm preferred option. | May 2001 – Aug 2001 |
| Reservoir engineer | SEPTAR | Examine scope opportunities identified during the V2V peer assist and analyse subsurface uncertainty. Propose development options. | May 2001 – Aug 2001 |
| Production technologist | SEPTAR | Validate existing completion and well architecture strategies and suggest improvements. Evaluate most appropriate completion strategy for maximising recovery from V2V scope opportunities. | May 2001 – Aug 2001 |
| Concept engineer | SEPTAR | Validate existing surface facility strategy and consequences of scope maturation. | May 2001 – Aug 2001 |
| PDO INITIAL TEAM | | | |
| Team Leader <i>Additional position required from Jun 01</i> | OYM | Co-ordinate integrated petroleum engineering study team and assist technically where required. Ensure technical quality and timely delivery. | Jun 2001 – Feb 2003 |
| Carbonate geologist <i>Additional position required from Jan 02</i> | OYM | Update/construct full field static model for field development planning (XGL resource secured until Jan 2002). | Sep 2001 – Feb 2003 |
| Carbonate petrophysicist <i>Additional position required from Jun 01</i> | OYM | Validate existing petrophysical models and analyse subsurface uncertainty for field development planning. Detailed petrophysical reservoir characterisation to examine scope opportunities identified during the V2V peer assist. | Jun 2001 – Feb 2003 |
| Reservoir engineer <i>Additional position required from Jan 02</i> | OYM | Update/construct dynamic models for field development planning (XGR resource secured until Jan 2002). | Sep 2001 – Feb 2003 |
| Well engineer (part time) | TWD | Validate existing well engineering strategies and suggest improvements. Contribute to field development planning. Evaluate most appropriate well engineering strategy for maximising recovery from V2V scope opportunities. | Sep 2001 – Feb 2003 |
| Concept engineer <i>Additional position required from Jan 02</i> | OYM | Optimise surface facility strategy and contribute to field development planning. Consolidate optimal surface facility strategy for scope maturation (part time OYM resource secured until Jan 2002). | Sep 2001 – Feb 2003 |
| PDO TEAM EXPANSION FOR FDP PREPARATION | | | |
| Carbonate seismologist <i>Additional position required from Jan 02</i> | OYM | Seismic reservoir characterisation for field development planning and in-field appraisal. | Jan 2002 – Feb 2003 |
| Reservoir engineer <i>Additional position required from Jan 02</i> | OYM | Update/construct dynamic models for field development planning. | Jan 2002 – Feb 2003 |
| Production technologist <i>Additional position required from Jan 02</i> | OYM | Validate existing completion strategies and suggest improvements. Contribute to field development planning. Evaluate most appropriate completion strategy for maximising recovery from V2V scope opportunities. | Jan 2002 – Feb 2003 |
| PDO TEAM EXPANSION FOR SCOPE MATURATION | | | |
| Carbonate geologist <i>Additional position required from Jul 02</i> | OYM | Detailed geological reservoir characterisation to examine scope opportunities identified during the V2V peer assist. | Jul 2002 – Feb 2003 |
| Reservoir engineer <i>Additional position required from Jul 02</i> | OYM | Detailed dynamic modelling to examine scope opportunities identified during the V2V peer assist. | Jul 2002 – Feb 2003 |
| Reservoir engineer <i>Additional position required from Jul 02</i> | OYM | Detailed dynamic modelling to examine scope opportunities identified during the V2V peer assist. | Jul 2002 – Feb 2003 |

| SCHEDULE | | | | | | | | |
|------------------|-------|-------|--------------|----------------|----------------------|-------|--------------|------|
| | 2Q01 | 3Q01 | 4Q01 | 1Q02 | 2Q02 | 3Q02 | 4Q02 | 1Q03 |
| SEPTAR Study | STUDY | | | | | | | |
| FDP Area 1 | | STUDY | | | DEVELOPMENT DRILLING | | | |
| FDP Area 2 | | | | STUDY | | | DEV DRILLING | |
| FDP Area 3 | | | | STUDY | | | DEV DRILLING | |
| Scope Maturation | | | PILOT WELL S | DATA GATHERING | | STUDY | | |
| AGREED | OYM | OYP | OYE | UPD | UPR | CEM | CTM | |
| Date: | | | | | | | | |



From: Percival, Iain IDR SIEP-EPT-OE-HL
To: Bouman, Hans MGJ NAM-EPE-P-BC
CC: 'hans.bouman@[REDACTED]'
BCC:
Sent Date: 2003-11-30 14:18:23.000
Received Date: 2003-11-30 14:18:23.000
Subject: RE: Farewell
Attachments:

Dear Hans,

As has been said in some of the replies to your e-mail and by many over the past "n" years - you are different and the Group will be the poorer for your departure. I do not think it will be long before I follow. The Group you and I joined together all that time ago is history, gone for good, screwed by one leading incompetenet after another over the past +/- 10 years. I was ejected from my last rather enjoyable job (by Karel as a matter of fact) because I refused to endorse the HYPE from the USA on how all things done by Shell Deepwater Services are the ultimate in perfection. We are suffering major problems in the GOM as a result of their and colleagues' HYPE and it will not be long before the world realises that the great flagship project Bonga is similar. It breaks my heart.

Since my ejection, I have been employed as so called Global Leader Hydrocarbon Maturation to magic out of nowhere lots of bbls of oil to improve our miserable RRR and to do something about the miserable state of hydrocarbon accumulation development planning. The cure all invented by a deadly trio of John Bell, Brian Ward and John Darley is that of Global Processes.

Evidence of utterly incompetent wrongdoing in our projects world wide (and I have plenty just like I collected on Chadwick in our Argentina days) is NOT WELCOMED.

My NRD is August 2006, but under the old Brit pension scheme which I just got into before it was altered, means I can retire with reduced benefits at any time within 5 years of that date.

You have done many many things for the world of production technology and many prod techs - I hope they never forget.

Take care of yourself and I am sure you will continue to be an ascerbic commentator on the world around you from whatever new perspective that may be.

Hopefully we will meet up again as grumpy old men!!

(My private e-mail address is i.percival@[REDACTED])

Kindest regards,

Iain

> -----Original Message-----

> From: Bouman, Hans MGJ NAM-EPE-P-BC

> Sent: 26 November 2003 12:56

> To: Aalbers, Angela A SHLGB-DRE/3; Aalbers, Remco RD

> NAM-EPE-T-D; Anderson, Mary Grace SUKEP-EPE-TDC; Anonsen,

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> Blascos, John JA SIEP-EPB-C; Bogaert, Philip SBRASEP-U;

> Bogers, Harry HEA NAM-EPE-P-GO; Bostock, David R

> SUKEP-EPE-TDC; Bower, Alison AV NAM-EPE-P-EG; Bradshaw,

> Martin J SI-ID; Brandao, Sergio SUSGP; Brinded, Malcolm A

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> Dean, Claire CG NAM-EPE-T-D; Den Bezemer, Taco T

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> Bart SARAWAK-EPA-TDM; Van De Vijver, Walter SI-MGDWW; van der
> Meer Mohr, Pauline PFM SI-ITCHR; Van der Meijden, Harry HAJM
> SI-GM; Van Ditzhuijzen, Paul PJD SEPI-EPH-D; Van Dongen, Hans
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> Kempen, Hans JTM NAM-EPE-T-PC; Van Kuijk, Erik E
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> Zaafrani, Nejib SEPI-EPB-M; Zijlmans, Briene BP SEPI-EPG-BFM

> Subject: Farewell

>

> Dear All

>

> All good things must come to an end and finally, after 32
> years, I will be leaving Shell 2 yrs ahead of plan with
> Voluntary Severance. Shell allowed me to see the world in a
> comfortable lifestyle and contribute to the business of EP. I
> look back at a very good and interesting time where I learned
> a lot and made many friends.

>

> I leave without any bitterness despite what some maybe
> thinking. The last half year was occasionally a bit difficult
> as I did not see eye to eye on some business issues and the
> 'modern' leadership style of some and it has been my
> principle to never be quiet if I see things that can be improved.

>

> From now on you will have to do without my advice, abuse,
> insults, jokes and general noise which was coming from the PC
> wherever I was residing. I will only be a shareholder but
> beware, my email arm is long and I can still find you if I
> see things that need improvement. And (for the Shell people)
> remember, you don't work for the analysts nor your boss nor
> yourself, you work for shareholder value! All else is secondary...

>

> I contemplated for a while whether I should send you this
> email as a BCC or open and decided on the latter. You have
> been (and I hope will continue to be) my network which has
> helped shape me in my ideas and behaviours. I hope you do not
> feel exposed now others can see whom belonged to my network
> and for completeness sake, I hereby state that there are
> several people who have mainly received emails from me so you
> can always claim: I could not get rid of the idiot and I
> never wanted anything to do with him!

>

> But all of you are special: you are either competent,
> diverse, decent or have a sense of humor. Many of you even
> have more than one of these traits.

>

> I wish all of you everything you can wish for in your career
> and personal life and hope to meet you again on email or in person!

>

>

> Hans Bouman

>

> Private email: hans.bouman@[REDACTED]

>

**UNITED STATES DISTRICT COURT
DISTRICT OF NEW JERSEY**

| | | |
|--------------------------------|---|--------------------------------------|
| |) | Civil Action No. 04-374 (JAP) |
| IN RE ROYAL DUTCH/SHELL |) | (Consolidated cases) |
| TRANSPORT SECURITIES |) | Hon. Joel A. Pisano |
| LITIGATION |) | |
| |) | |
| |) | |

DECLARATION OF IAIN PERCIVAL

I, IAIN D.R. PERCIVAL, declare and say:

1. From July 1, 1999 until July 2003, I worked within an organization called Shell Exploration and Production Applications and Research (“SEPTAR”).

2. Unless otherwise stated, I make this declaration on personal knowledge and am competent to testify as to the matters set forth herein.

3. I am informed that Royal Dutch Petroleum Company and The “Shell” Transport and Trading Company, p.l.c. (collectively, “Shell”) are defendants in the above-captioned securities class action. I understand that an issue in this case involves the nature and extent of any United States conduct from April 8, 1999 to March 18, 2004 relating to the estimation or reporting of proved reserves that Shell later restated. I am making this declaration in connection with Shell's submissions on this issue. I previously was deposed in this matter on

February 9, 2007. I understand that the Court and the parties have access to the transcripts of those proceedings.

Employment History

4. From November 1998 until July 1, 1999, I worked at a Shell laboratory called Research and Technical Services, in Rijswijk, the Netherlands, as Vice-President of Technology Development. I helped develop software used for subsurface hydrocarbon exploration and production.

5. From July 1, 1999 until July 2003 I was the leader of the Geosciences and Integrated Services cluster of SEPTAR.

6. From July 2003 until I retired from Shell in 2006, I was the Shell Group Chief Petroleum Engineer/Global Leader – Hydrocarbon Maturation.

7. From November 1998 until 2006 I worked in Rijswijk.

SEPTAR Background

8. SEPTAR was created on July 1, 1999 when Shell combined two independent laboratories and personnel located in Rijswijk and in Houston, Texas. The Rijswijk laboratory was called Research and Technical Services. The Houston laboratory was located within the Bellaire Technology Center.

9. SEPTAR was primarily a research and development organization focused on technology applicable to exploration and production. SEPTAR was organized in five clusters, three of which – Wells, Novel

Technologies, and Shared Earth Model – performed primarily research and development. The fourth cluster, Surface, performed engineering services related to above-ground oil production facilities. (Surface was removed from SEPTAR on January 1, 2001.) The fifth cluster – Geosciences and Integrated Services – performed subsurface services.

10. Between July 1, 1999 and 2003, there were a number of other groups within SEPTAR. There was a Value Assurance Services group located entirely in Rijswijk within SEPTAR. There also was a Business Interface Manager group that liaised between Shell operating units and SEPTAR clusters. In 2002, a Portfolio Management and Implementation group was formed to coordinate and facilitate software technology deployment.

11. I was the leader of the Geosciences and Integrated Services (“GIS”) cluster. I reported to SEPTAR’s director, Paul Sullivan, who worked in Rijswijk, as did SEPTAR’s other top officials.

12. GIS itself consisted of multiple sub-clusters. Many of the sub-clusters were staffed with specialists in highly technical fields, such as geology, geophysics, geomatics, reservoir engineering and petrophysics. These sub-clusters had members in both Houston and Rijswijk. However, two sub-clusters – AGH and AGI – were almost entirely separated between the United States and Europe. AGI’s staff was located initially in Rijswijk, and in 2002 and onwards in Aberdeen

as well. AGH staff was located almost entirely in Houston, but four AGH engineers were located in Rijswijk.

13. AGH and AGI performed integrated field studies. AGH was led by Lyle Henderson, in Houston. AGI was led by Iman Hill, Richard Waterland, and Piet Ruijtenberg, in Rijswijk.

14. GIS performed technical services for operating units on a customer-to-service-provider basis. The customers – Shell operating units – paid the particular GIS sub-cluster at different rates, depending on whether Shell was the sole operator of the hydrocarbon field receiving the services.

15. The operating unit always retained ultimate responsibility for all decisions relating to GIS's technical services. As a mere technical service provider, GIS did not participate in business decisions affecting the operating unit's hydrocarbon fields.

16. As the leader of GIS, I ensured that the staff of the sub-clusters, particularly AGH and AGI, understood the importance of deferring to the operating units. GIS staff members were highly educated and had very specialized technical skills. However, unlike the operating unit staff, they did not have the experience with, or exposure to, the local commercial and economic factors affecting field development planning. Thus, GIS staff members understood that an

operating unit often would decide not to employ a creative technical solution to a problem for a range of other, non-technical reasons.

AGH and AGI

17. GIS's field services were "ring-fenced," so AGH staff (in Houston) and AGI staff (in Rijswijk) did not work together. This division of labor predated SEPTAR's formation.

18. Before SEPTAR was formed, the services group in Research and Technical Services ("RTS") in Rijswijk and the services group in the Houston laboratory – located in the Bellaire Technology Center ("BTC") – had performed services based upon the geographic location of the operating units being served. RTS worked predominantly on fields located outside the United States, and BTC worked predominantly on fields located in the United States.

19. After SEPTAR was formed from components of RTS and BTC, the operating units remained accustomed to calling up personnel at the Rijswijk or the Houston lab directly to obtain their services.

20. Although Shell Exploration and Production Technology ("EPT") leadership wanted AGH to perform services for operating units outside the United States, we decided not to encourage this expansion of AGH's role. There were two principal reasons. First, we feared that, if both AGH and AGI were staffed on the same non-U.S. based project, the operating unit would ignore

AGH and continue dealing with AGI, as it had dealt with AGI's predecessor, RTS, in the past. Second, mixed teams with U.S. and non-U.S. based staff would have expended considerable administrative resources because each sub-cluster worked on a cost recovery basis, and the U.S and non-U.S. based staff were paid different salary rates.

21. AGI also was a much larger sub-cluster than was AGH. AGI therefore performed the majority of GIS's integrated field study work. For example, AGI had in the order of 60 staff members devoted exclusively to performing technical services for the Shell Petroleum Development Company of Nigeria ("SPDC"). This group was known as the SPDC "seamless team," because it allowed SPDC to have services performed rapidly, without staffing or coordination delays. It was composed of both SEPTAR staff and national staff seconded from SPDC for a duration dependent on each project. Total staff numbers would fluctuate depending on the number, complexity and maturity of projects at the time. The SEPTAR staff on the SPDC "seamless team" were all based in Rijswijk.

22. AGH, in contrast, never had more than 30 staff members in total. The closest AGH ever had to a "seamless team" was for the United States Exploration and Production operating unit Shell Exploration and Production Company.

PDO Field Studies (Oman)

23. One of the few operating units that looked to both AGH and AGI for field studies was Petroleum Development Oman (“PDO”).

24. Before SEPTAR was formed, a group within RTS had performed field studies for PDO. After SEPTAR was formed, only AGI (the former RTS) performed field studies for PDO until 2001.

25. In 2001, PDO created the “T50” initiative, which aspired to increase hydrocarbon recovery by the year 2030, in part by using Enhanced Oil Recovery (“EOR”) techniques. AGH became involved in the EOR feasibility studies associated with the T50 initiative in late 2001, because several AGH staff members had acquired EOR skills whilst developing and implementing EOR techniques on United States fields in the 1980s.

26. PDO staff and SEPTAR staff formed an informal group to coordinate staffing on EOR feasibility studies in connection with the T50 initiative. The SEPTAR representatives in this group included Rob Willis, Dan Antheunis, Keith Eastwood, Jerry Vertal, Stein Christiansen, and Zara Khatib, all of whom worked in Rijswijk.

27. During the early stages of the T50 initiative, PDO expected the AGH staff to assist with the initial phases of the technical feasibility studies and then turn the projects over to PDO personnel. This transition ultimately occurred

around the end of 2003, when PDO established its own technical services group in Muscat, Oman.

28. AGH performed feasibility studies between late 2001 and 2003 on the Lekhwair, Al Huwaisah, Natih-B, Rahab, and Mukhaizna fields. None of these studies estimated proved reserves, because, as I stated above, AGH's services were limited to preliminary EOR technical feasibility studies.


29. Between 2001 and 2003, AGI performed considerably more work for PDO than did AGH. AGI performed field studies for PDO on the Amin, Nimr G, Zauliyah, Karim West, Marmul, and Natih fields during 2002 and 2003. Like AGH's EOR feasibility studies, AGI's field studies did not estimate proved reserves.

30. I am not aware of any GIS field study or technical service that estimated or reported proved reserves for any Shell operating unit, including, but not limited to, PDO. It was the responsibility of the Shell operating unit staff to estimate and report proved reserves.

I declare under penalty of perjury under the laws of the United States
of America that the foregoing is true and correct.

KUALA LUMPUR, MALAYSIA

Dated: [City, State]
June 12, 2007]



Ian D.R. Percival