

EPT Note to EPLF

May 2002

INCREASING "OU PULL"

In addition to the effort described above, other steps, recommended by the TSMT, have been taken toward implementation of an enhanced "Technology Deployment Framework". This will maximise value generation from new technology implementation (beyond a first implementation in an OU).

The guiding principles are to:

- Manage technology as any other resource, i.e. integrate implementation into business plans, and have a "plan, do, review" loop;
- Have an effective mechanism to deliver implementation support;
- Build on existing best practices and honour different levels of "sophistication" in technology management in OUs.

This approach, which has already been implemented in several major OUs, should help to achieve asset "pull" for new technology in all OUs, and all assets. The TSMT has recommended OUs have:

- Longer term, business driven technology needs/aspirations (for example from Business to Technology Maps), with value statements;
- A "staircase" per project/asset, i.e. a multi year plan of activities to achieve these needs/aspirations.
- Benefits expressed in (risked) Δ production, Δ cost, Δ reserves, and/or other value measures;
- New technology implementation milestones included in business plans, along with resource requirements;
- A mechanism to track progress (value delivery) against the value statements.

This "OU pull" will be complemented by effective implementation support provision by STEP and SGSi. To enable the roll up of resource requirements, OUs will be asked to specify their planned new technology implementations (with expected benefits) in their Volume 2 submissions. An essential element is coordinating this work within an OU, such that the highest priority issues are resourced and supported, and synergies are sought.

Actual implementation and value achieved against these plans will be assessed through Volume 1.

To make OU staff aware of the technology offerings, the implementation requirements and support that can be provided, STEP will issue each year in October a "catalogue" of new and emerging technologies for implementation. Although initially focussed on Shell technologies, this catalogue should in the future also include valuable third party technologies. Furthermore, the BIMs will actively facilitate the implementation of these concepts in the OUs they support.

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EPT Note to EPLF

May 2002

APPENDIX
GLOBAL IMPLEMENTATION AND BUSINESS RESULTS

TECHNOLOGY	2001 RESULTS	2002 PLANS
Expanded Tubulars	\$166 MM NPV	Double number of applications
Underbalanced Drilling	\$160 MM NPV	Double number of programs
Smart Well Solutions	\$193 MM NPV (applied or committed)	Expanding GIT to accelerate applications
4D Reservoir Imaging	\$135 MM NPV	25 4D surveys
High Rate Completions	50 completions	Expanding team to meet needs
Water to Value	\$35 MM NPV	Initiating implementation team to accelerate applications
Smart Fields	First Smart Field commissioned in BSP	Firm up 10 projects in launch OUs
Integrated Subsurface Modeling	n.a.	Project plan approved, 3 OU demonstration projects finalised

The **Expandable Tubulars** effort, led by John Dewar, has had a substantial bottom line impact on many OUs through use of expandable sandscreens and solid expandables. Work is progressing towards the monobore well moonshot, with a first field trial planned for later this year in South Texas. Shell has a substantial lead on the industry in number of implementations and in technology development.

The **Underbalanced Drilling** effort, led by Brian Truelove, has seen implementation increase significantly, with active programs now in 6 OUs, expanding to twice that number this year. Value primarily comes from well productivity improvements vs. conventional wells. Shell has three times the UBD programmes as the rest of the majors combined, and has locked up much of the industry expertise.

Smart Well Solutions, led by Carlos Glandt, have seen applications increase with business impact shown reflecting both installed and committed projects. Technology development continues in a number of areas, and additional resources are being provided to work directly with OUs on system and hardware selection and field deployment. By mid-2003 Shell will be the E&P industry's biggest user of smart well completions.

Time Lapse Reservoir Imaging (4D), led by Hans de Waal, has reached a level of maturity across many OUs such that the team is switching to a direct charge based service provision, with some resources being moved to a new linked implementation project on Integrated Subsurface Modeling. Shell is now leading the industry in the application of 4D with active participation by almost all OUs. There will be a continued need for central support from SEPTAR with responsibility shifting to the OUs.

The **Smart Fields** effort, led by Pieter Kapteijn, 2001: The Group's first smart field was commissioned in SSB and BSP committed to a Smart Field development approach to Champion West (2004). We are on track to hit our moonshot fully about a year early. In 2002 the team will develop methodology and framework for smartness and firm up 10 projects in launch OUs: BSP, SSB, PDO (possibly SEPCO, EXPRO, NAM).

High Rate Well Completions have been spearheaded by the Applied Well Technologies Team (EPT-AWT), now under the leadership of John Hofland. Though this is not an official global implementation team, the focused effort of this team has resulted in significant well productivity gains in a number of OUs, including SEPCO, PDO, BSP, and SSB, among others. The team has been increased in size to provide more direct OU support, particularly for production opportunities in Nigeria, Oman, and the US.

Water to Value Team, led by Zara Khatib, is also not an official global implementation team, though this group recognised the need to move from R&D to more technology implementation support. As such, resources were reallocated to working directly with OUs on efforts to reduce water production, increase hydrocarbon production, and positively impact sustainable deployment through better water management.

Integrated Subsurface Modeling is a new effort starting this year that aims to achieve a step improvement in the way we characterize, model, and manage reservoirs. The leader of this team will be named shortly. The team will address gaps in technology skills tools, workflows, and their implementation, with the intent to maximise impact on production and reserves replacement starting in 2002, with full effects to be seen in 2003 and beyond.

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EPLF -- NOTE FOR DISCUSSION, MAY 2002

Smart Fields: A Vision of the Future of the E&P Industry

SUMMARY

Smart Fields is seen as the next step in E&P industry capability and a key initiative to improve the performance of Shell's E&P assets. The Smart Fields program proposed builds on the successful Global Implementation Team model and integrates or aligns with related programs. EPLF is requested to endorse a forward-looking strategy to build an industry leading capability in Smart Fields. Specifically, all OU's are requested to designate senior focal points/champions who are in a position to integrate disciplines and technologies and can effectively network to implement, with the assistance of a SEPTAR based Smart Fields team, a portfolio (staircase) of projects.

Smart Fields: what is it?

'Smart Fields' is a vision of the future of the E&P industry. It defines a core capability that Shell must develop over this decade. Like all maturing industries, the E&P industry will have to successfully manage a step increase in information and knowledge intensity to achieve the next level of performance. In order to maintain our reputation as the E&P industry technical leader and attract top talent to the company, Shell must lead in Smart Fields. In addition to building excellence in the capabilities required for today, we must begin to build the capabilities that will determine our success in the future. The proposal is to initiate a program to do that.

Smart Fields promotes and integrates the (information) technologies, skills and work-processes that allow continuous and sustained improvement of lifecycle asset performance. A central concept in smart fields is the *'value loop'* consisting of data gathering, modeling and decision making, in support of field development, management and optimization activities. Novel technologies increasingly allow us to *'acquire the data we need to support our decisions, rather than use the data we have'*. We can gather, process and use both static and dynamic asset performance data more cost-effectively than ever. Periodic optimization can thus be replaced with continuous *'real time'* optimization yielding significant production gains (fig. 1). Ideally a Smart Field *learns from and adapts to* changing conditions and new data. With smart wells we now also have the means to effect control over reservoir and production system performance. A well with multi-zone inflow controls and metering can replace multiple wells/drainage points, improving the cost-efficiency of draining complex reservoirs, yielding higher production rates and increased ultimate recovery (fig. 2).

The concept of the asset lifecycle as a *spiral* has been developed in Smart Fields (fig. 3). Current practice is to concentrate on the optimization of individual lifecycle phases and management loops. However, decisions made at one phase of the lifecycle can limit/determine the options available in the future. In Smart Fields the IT-enabled collaborative work environment allows asset teams to generate and evaluate an increased number of development options. New technology creates opportunities for a much tighter integration of data, models and decision. In addition, relevant knowledge can be accessed remotely and control activities can be initiated off site.

What is the Business Impact?

The potential of Smart Fields to increase Group asset value is seen to be very significant and is estimated at more than \$ 250 mln/yr. Smart Field concepts, systematically applied, can extend the economic life of Shell's assets through increased production and recovery, remote operations and operational flexibility. E&P and non-E&P examples (aircraft, car industry, pharmaceuticals) of 'smartness' have been reviewed; extrapolation yields the following targets for a Shell program:

- A better than 10% increase in production from existing and new assets
- More than 5% increase in Ultimate Recoveries (>10% in water/steam-floods)
- Significantly reduced Opex through de-manning, remote operation and maintenance

- A reduction in development planning/updating cycle times of more than 75%
- Reduced development risks and uncertainties
- Improved forecasting and production planning

Competitive Intelligence puts the business value other companies have attached to their Smart Field programs at \$ 150-275 mn per year for bp (pre-Amoco), Chevron-Texaco and PDVSA, from pre-dominantly subsurface applications. There is little or no downside risk to Shell in undertaking the Smart Field program.

Where does it fit?

Smart Fields is a key integrating 'umbrella theme' for a large part of our R&D and commercial technology access activities (STV). Coordinated closely with PM&I (Portfolio Management and Integration) and EP-CIO activities, it provides a framework for integration, IT and e-business projects and helps define future skill requirements for T&OE. (The major OU defined projects will be entered in the T&OE opportunity register). Eventually the current Smart Well effort will be merged with Smart Fields.

The industry is closely watching the moves of majors in this area. ISPs have, without exception, reacted very positively to the ideas and concepts Shell has developed and have volunteered risk-shared cooperation in implementation and technology development projects. Both Chevron-Texaco and bp are offering to share data and exchange information on their programs.

Barriers and Enablers

Experience with Global Implementation Teams has shown that a considerable amount of 'on-site' assistance and seed money is required to get OUs to investigate and implement new projects. Many asset teams are saturated with ongoing improvement efforts. There is a need to coordinate/align between activities, both on the provider and the customer/OU end. Integration is a key success factor, and requires clear accountabilities and authorities for designing and delivering complete solutions.

SF projects must be tailored to meet the specific business drivers of the asset. There is no generic 'one size fits all' Smart solution. Considerable effort will have to be put into sharing and disseminating knowledge and learning.

Unless there is active sponsorship at EPLF level, Smart Fields is unlikely to take hold in view of the many competing priorities and business pressures. Smart Fields is often about investing in longer-term asset value, which must complement our current focus on short-term production improvement and cost reduction. The budget must be sufficient to create and sustain momentum and 'pull in' industrial partners.

A significant enabler is that some OU's (BSP, SSB and PDO) have already committed to become lead OUs. The recent South-Furious-30 and Champion-West development projects amply demonstrate the value and power of the Smart Fields concept.

Plans and Budgets

The current plan is to develop, over the next 12 months, a portfolio ('staircase') of projects with lead OUs. Priority will be given to smartness in production and reservoir surveillance to capture early value, moving later into development planning (FDP) and well execution phases. Early projects are expected to include e.g. retrofitting low-cost CAO and web-based data management infra-structures to improve production/maintenance surveillance, integrating Smart Well and 4D/micro-seismic data flows/models and integrated production system (wells + facilities) design and optimization.

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Current and emerging capabilities, both internal and external to Shell, are being mapped. Investments to accelerate technology development in critical areas are planned: e.g. distributed pressure sensing, real-time data analysis, and training simulators. Our R&D focus in Smart Fields is on progressively shifting our modelling and decision making capabilities, while a commercial technology access model may be applied to the rapidly commoditising data acquisition and data management areas.

It is estimated that the program will take 20 man-yr and a sustained investment level of some \$ 10 mln/yr over the next 5 years. This is in line with the scope and size of similar projects in other industries and comparable to the initial Smart Wells effort.

Following a review with the TSMT, the decision was made to leave over half of the Smart Field funding requirement to OU direct charge. However, given the lack of resources and the near-term production focus in most OUs, this variance from the successful GIM model carries a significant risk of slow progress or even failure. EPLF is asked to consider increasing the GSF by \$5 million to accelerate the Smart Fields effort.

Conclusions: Shell's Edge and Positioning

Smart Fields is an organizational *capability* rather than a *technology in the simple sense of the word*. It requires an enabling organization to help balance skills, workflow and technology elements. It creates an infrastructure that enables and sustains improvements we make to our assets and allows us to systematically capture and share learning across the assets and OUs. This long-term investment in our core capabilities will be a major determiner of how successful we are in the future. Smart Fields can become a significant and sustainable differentiating capability for Shell E&P; once developed it will be very difficult to replicate by others.

The ability to extract the maximum value from hydrocarbon resources at all times and under all conditions will increase our attractiveness as a partner. Smart Fields, as a 'high tech' vision of our E&P business, appeals to many of our staff and will help to attract leading engineers to our company.

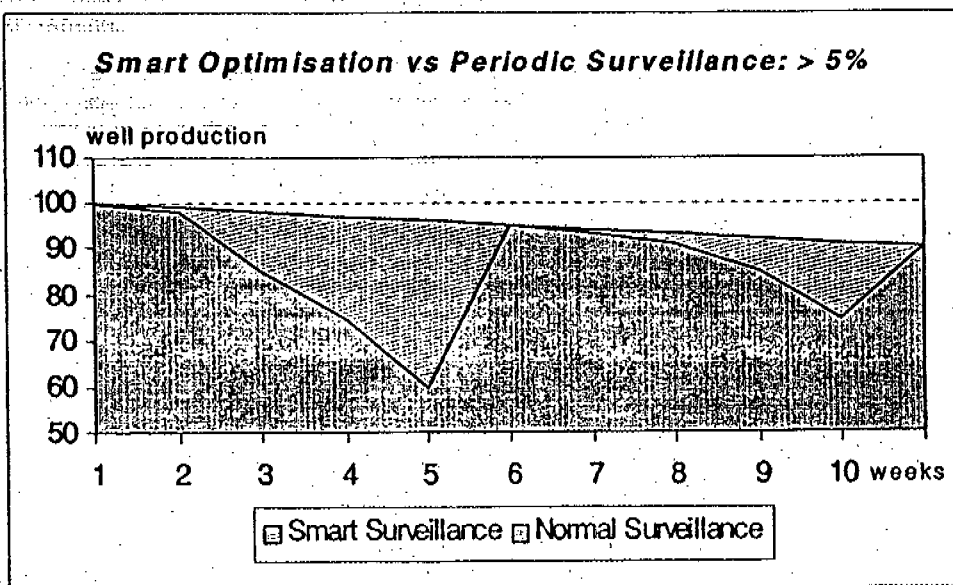


Figure 1. Impact of real time optimisation

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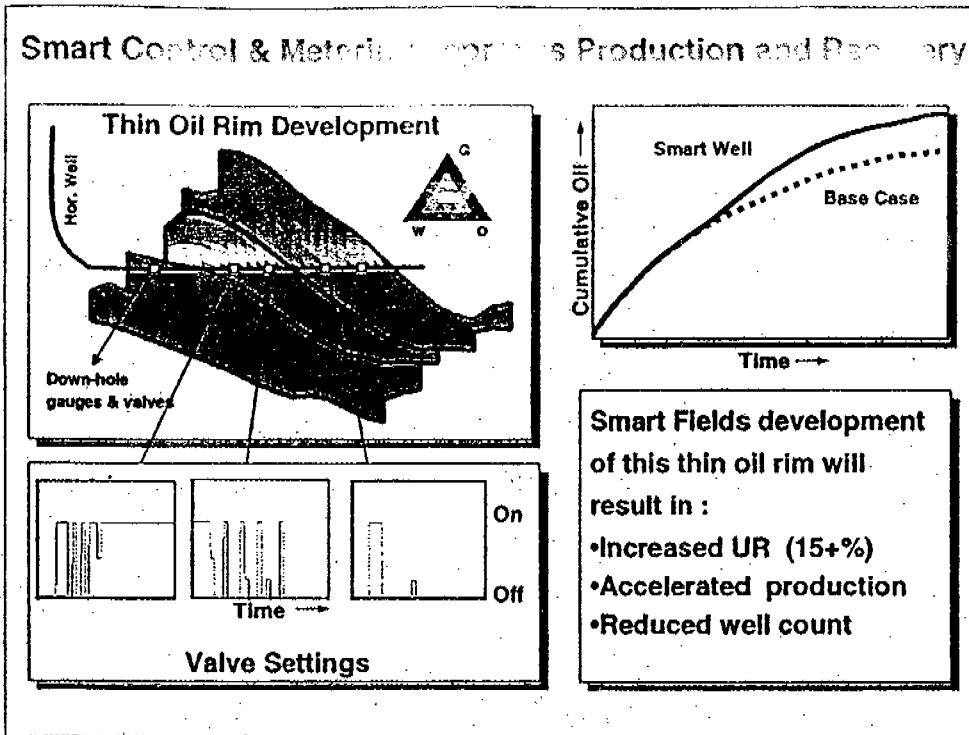


Fig. 2 Smart Well/Field development concepts improve economics

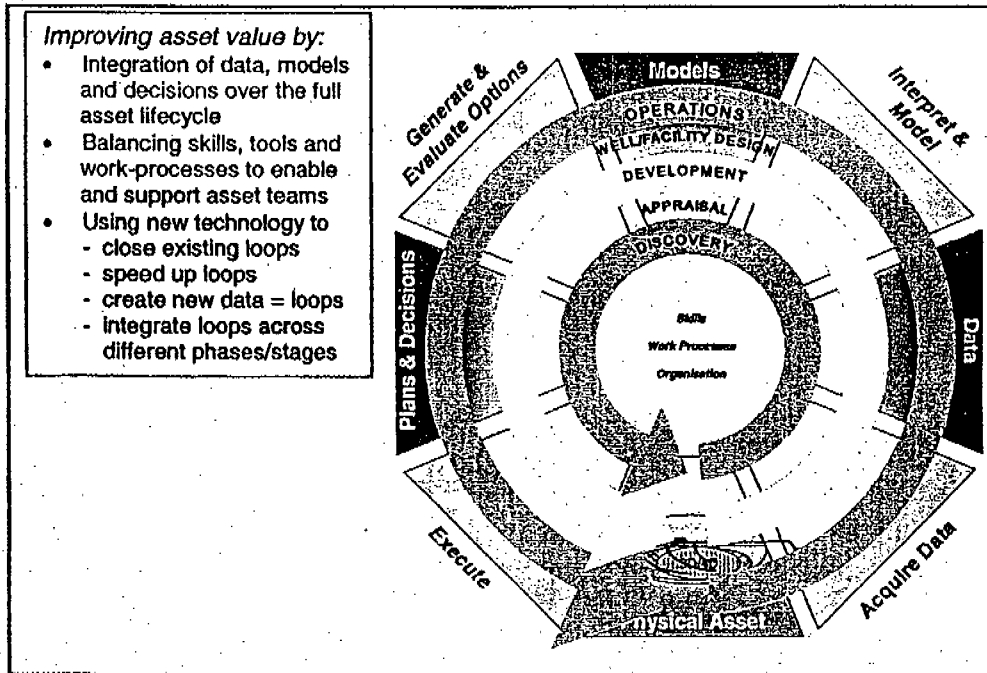


Fig. 3 The Smart Fields 'Value Loop' and Asset Life-Spiral Model

EPT Note to EPLF

May 23, 2002

Note For Information to EPLF, 23 May 2002

SIEP Global Charges

This note will inform CEO's of the proposed Global Charges budget for 2003.

Background

On 28 March 2002 a workshop was held with representatives from CEO's of several major Service Agreement Holders and the Sponsors in Central Offices, who provide the related services to review the proposed 2003 budget for SIEP Global Charges.

In its meeting of 11 March 2002 Excom had recommended to propose a budget for the 2003 SIEP Global Charges which remains flat as compared to the 2002 budget.

Objectives of the workshop:

- to develop a common understanding of the value propositions underpinning the various global charge components for next year's SIEP Global Charges budget, including the regrets in the program which had to be taken into account to keep the budget proposal flat compared to 2002 levels, and
- to arrive at an agreed recommendation for the EPLF in May 2002 for the 2003 SIEP Global Charges budget.

Recommendation

Workshop participants agreed to propose to EPLF a budget for 2003 SIEP Global Charges of USD 256.1 MM. This level was subsequently adjusted to USD 258.1 after reviewing the consequences of the changes in the charging mechanisms between Shell Global Solutions, SIEP and the EP OU's, but still in line with the targeted range of USD 250 MM to USD 260 MM as agreed at the workshop.

EPLF support is sought to endorse a budget for the 2003 SIEP Global Charges of USD 258.1 MM.

Attachment I shows the proposed changes to the proposed 2003 budget of USD 263.1 MM.

J. C. Darley
EPT
May 2002

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EPT Note to EPLF

May 23, 2002

USD Millions		2001	2002	Proposed Budget 2003	Proposed Budget 2003	Proposed Change to Budget 2003	Notes	Proposed Budget / Proposed EPLF
Technology Development Program								
Sullivan	BAA Program (base budget proposal) *	103.9	103.8	115.0	115.0	1.7	(1)	116.7
Sullivan	Global technology Implementation Program	20.1	20.8	17.8	17.8	-2.8	(1)	15.0
Sullivan	Technology Access Program	23.0	20.5	18.5	18.5			18.5
	<i>subtotal (base budget proposal)</i>	147.0	145.1	151.3	151.3	-1.1		150.2
Global Technology Services								
Ward	Well Engineering Forum	5.1	5.2	3.1	3.1			3.1
Ward	Capital to Value Forum	1.1	0.9	3.0	2.0			2.0
Ward	Production Forum	0.6	1.8	1.5	2.5			2.5
Ward	Reserves	0.0		1.5	3.0			3.0
Ward	Global Fora			-1.0	-2.5			-2.5
Ward	<i>subtotal Global Fora</i>	6.8	7.9	8.1	8.1	0.0		8.1
	Subsurface Software	0.0	0.3	0.0				0.0
Ward	Technical & Operational Excellence	0.0	0.0	1.7	2.5			2.5
Folder	Global Networks	5.0	4.7	6.2	5.2			5.2
	<i>subtotal</i>	11.8	12.9	16.0	15.8	0.0	(2)	15.8
Technology Support								
Folder	Global Learning	11.0	10.4	11.2	9.6			9.6
Rambousek	Access to Shell Global Solutions technology (OCA)	4.4	-2.2	4.4	4.4	-2.4	(3)	2.0
Antheunis	External Representation	4.0	3.5	4.0	4.0	-0.5	(4)	3.5
Sullivan	Portfolio Management & Integration *	0.0	0.0	5.0	5.0			5.0
Henderson	Information Technology Development **	2.0	3.3	7.7	7.7	-1.0	(5)	6.7
Henderson	eBusiness	3.9	1.8	4.0	3.0			3.0
Antheunis	IP Management (incl. Royalties)	-4.4	4.9	-4.4	-0.9			-0.9
Antheunis	Technology Play Mapping	0.0	0.0	0.0	1.5			1.5
	<i>subtotal</i>	20.9	21.7	31.9	34.3	-3.9		30.4
Non Technology Support								
Dubnicki	HRI Policy, Advice and Support	15.3	13.3	12.0	12.0	-1.0	(6)	11.0
Gardy	Finance Projects	5.4	6.2	5.4	3.8			3.8
Bichsel	Global Exploration	3.7	4.6	3.3	3.2			3.2
Ball	Planning, Economics and Capital Allocation	7.5	7.9	3.5	3.5			3.5
Zijlker	Reputation Management (HSE)	3.7	2.9	3.7	3.7			3.7
O'Neill	Reputation Management (EA)	2.1	1.0	2.1	2.1			2.1
FRD's	General Advice	2.6	1.6	2.5	2.5			2.5
Gardy	Global Procurement	3.7	2.5	3.7	3.0			3.0
Gardy	eProcurement (BuySite)	13.0	12.8	13.0	8.0		(7)	8.0
Gardy	SAP Blueprint/SAP Service for smaller OUs	1.0	0.8	3.0	3.9			3.9
Dubnicki	Recruitment & Expatriate Services	11.3	11.1	16.1	16.0			16.0
Darley	Contingency	2.0	1.0	1.5	0.0	1.0	(6)	1.0
ExCom	Offset to be found for IT FRD **	0.0	0.0	-5.7	0.0			0.0
	<i>subtotal</i>	71.3	65.7	64.1	61.7	0.0		61.7
Grand Total (base budget proposal)		251.0	245.4	263.3	263.1	-5.0		258.1

Notes * 2002 budget for the BAA program of USD 120.0MM included USD 5.0MM for the predecessor of FM&I

** 2002 budget for IT Development increased by USD 5.7MM for follow up IT FRD, to be managed within overall agreed ceiling of USD 263.3 MM

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EPT Note to EPLF

May 23, 2002

ISS:

- 1) Service Agreement Holders strongly support the value propositions of the Technology Development Program. It is proposed to shift budgets from Global Technology Implementation to the BAA program by increasing the budget for the BAA program by USD 1.6 MM and decreasing the budget for the Global Technology Implementation, reducing it by USD 2.8 MM as it is expected that OUs will have a bigger role in taking up new technology.
- 2) Further review of alignment of Global Networks with T&OE did not result in a lower budget for either Global Networks and/or T&OE at this stage. It is therefore recommended not to change those budgets.
- 3) The current arrangements with Shell Global Solutions were reviewed. It was initially assumed that fees and rebate for buying SGSI services may offset each other causing a zero impact to the Global Charges budget, however after discussions with SGSI, it is more likely that we will end up with a USD 2.0 MM charge as the base layer fee will not be offset totally by rebates received from SGSI.
- 4) It is proposed to reduce the 2003 budget for External Representation by USD 0.5 MM to bring it in line with 2001 actual spending
- 5) IT Development will be reduced by USD 1.0 MM by shifting more of the costs to Direct Charging.
- 6) It is proposed to transfer USD 1.0 MM from the severance budget, part of the HR Policy, Advice and Support budgets, into the ExCom contingency budget.
- 7) For 2003 Shell's contribution to Trade Ranger amounts to USD 6.5 MM, out of USD 8.0 MM for eProcurement. This amount has been reviewed as to Opex or Capex and upon advice from eProcurement/Group Accounts it is recommended not to change the accounting treatment of the expenditures and to continue to treat them as Opex.

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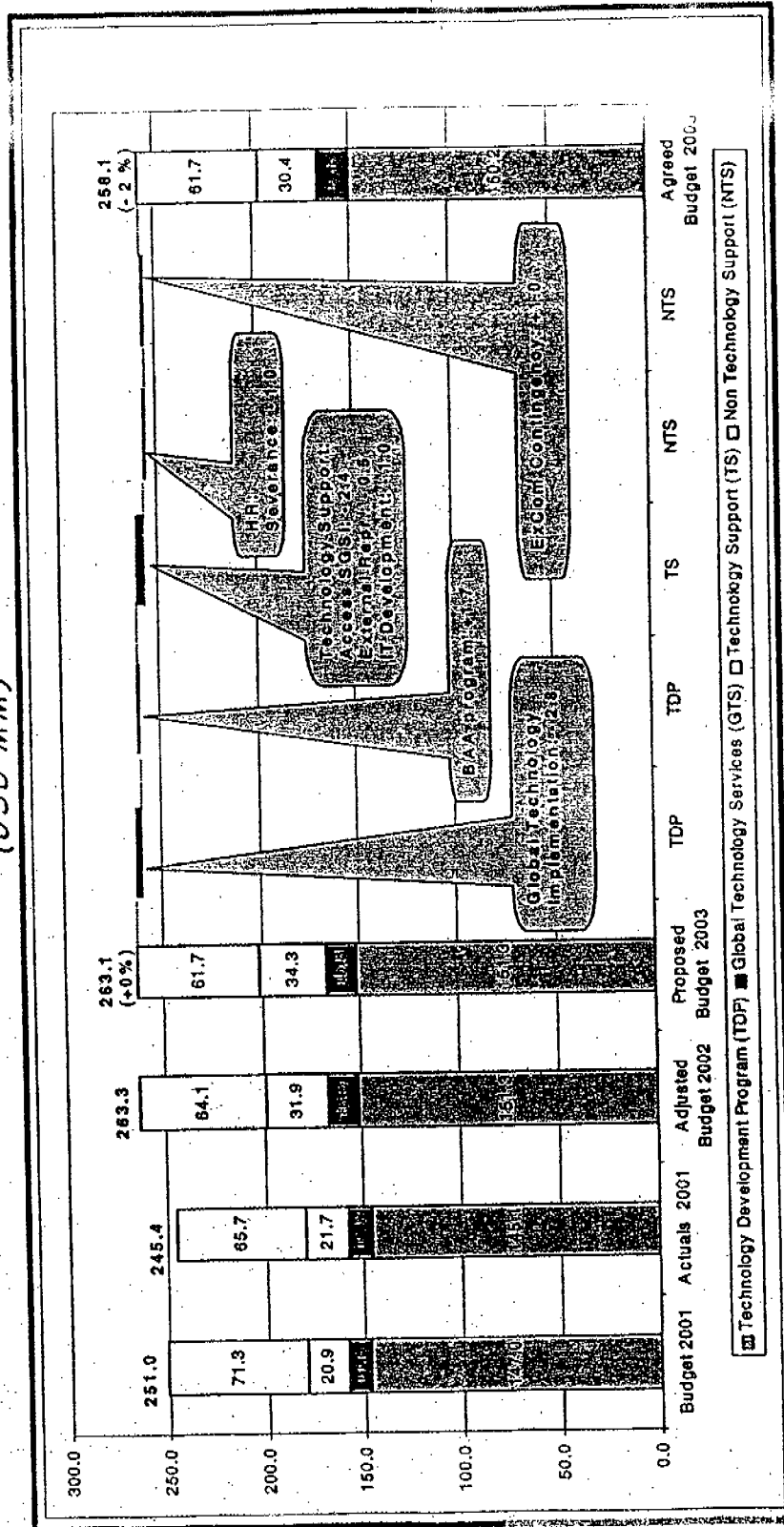
May 23, 2002

EPT Note to EPLF

Attachment I

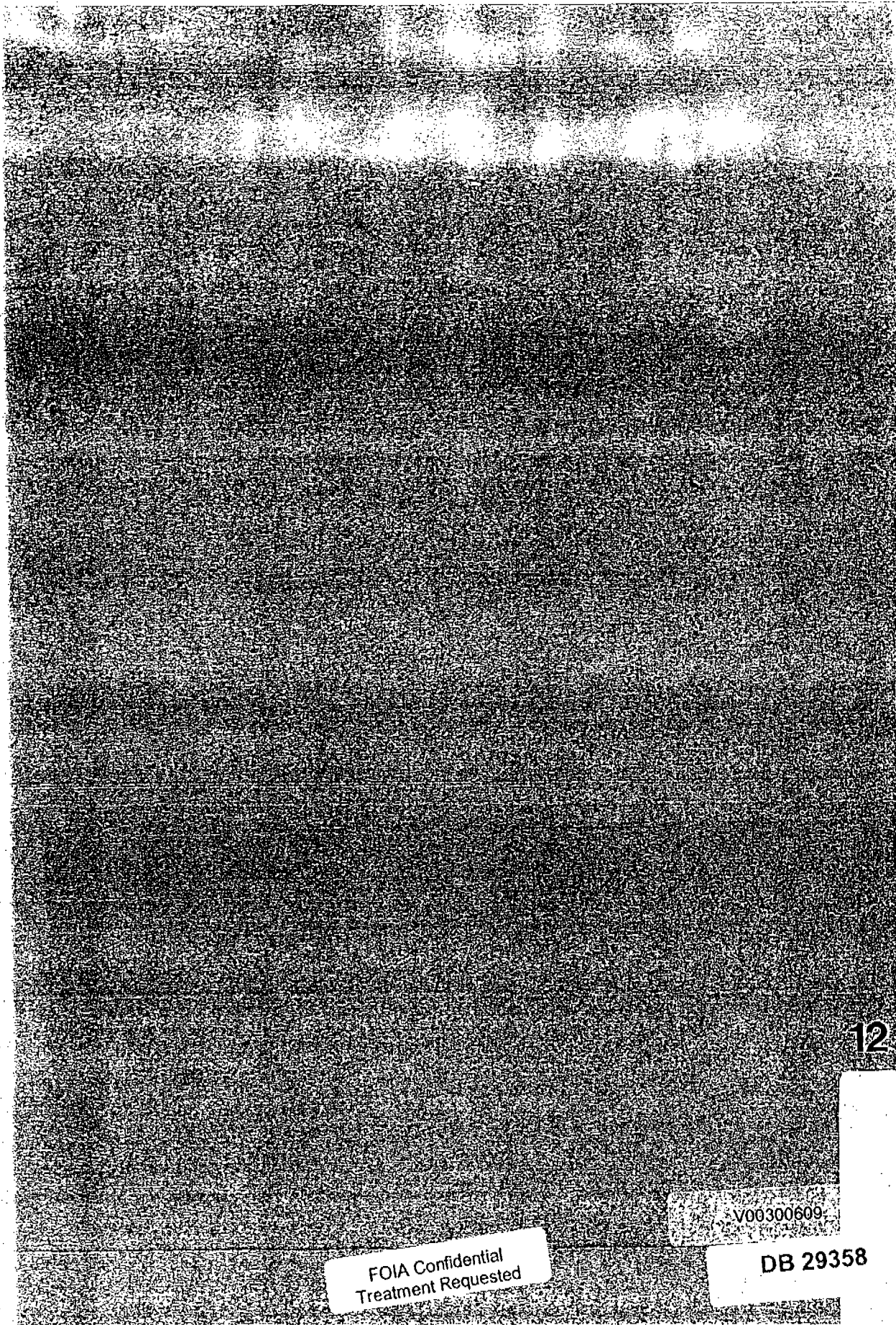
SIEP Global Charges Budget 2003

(USD MM)



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EPCIO

Delivering IT to the EP Bottom Line

EPLF is requested to:

- ① Agree to promote minimum global IT performance standards for all OUs (infrastructure, service reliability, security, basic IT skills for staff, business reporting).
- ② Support global sharing of IT resources to complete GI-D implementation.
- ③ Agree to implement EP Global Connect as the new global communication and global working model for EP.
- ④ Align eBusiness and IT resources within each OU.
- ⑤ Commit to providing more active support for IT:
 - Incorporate IT topics in presentations.
 - Communicate to staff on Leadership Team decisions taken on IT policy, budgets and standards.
 - Participate in local workshops with leadership teams on how IT can enhance OU performance.

More information on each of these requests is highlighted in the text of this pre-reading document.

EP CIO is working closely with OUs on its strategy of Delivering IT to the EP Bottom Line as defined by its Business Plan submitted to EPLF in December 2001. The team has prioritised IT projects and is focused on two key areas:

- Ensuring that IT reliability, availability and security standards meet EP's changing needs.
- Delivering results that directly contribute to EP's profitability and growth objectives and help build competitive advantage.

Significant results have been achieved in Q1 2002, with progress ahead of plan for the key projects in the Business Plan. Cost savings of \$13 million have been delivered to date from the annual year-end target of \$50 million, in addition to a deferred expenditure of an estimated \$33 million from the global 2002 expenditure plans.

This pre-reading document includes the background to the five requests which will be presented at the EPLF meeting on 23 May 2002 and also provides supporting information on four key areas of EP IT activity:

1. Status update on EP CIO business performance, including OU cost savings and project results delivered between September 2001 and April 2002.
2. Summary of actions taken by EP CIO in the past eight months to introduce business rigour to EP's IT function.
3. Update on EP CIO's programme to improve global IT infrastructure, and service reliability, availability and security. This section includes an update on GI-D.
4. Six strategic IT projects which are being undertaken to deliver competitive advantage to EP. This includes the new EP Global Connect communication and global working model.

EPLF May 2002

STRATEGIC IT

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