Texas City Refinery Retrospective Analysis

Summary of Results

October 28th, 2002

ATKEARNEY
an EDS company

The 2002 South Houston Assessment recommended that immediate action be taken to improve integrity and reliability

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Integrity

- Major infrastructure investment required
- Sustaining + HSE Capex budget of 0.3% ERV against suggested guideline of 1% ERV
- Second highest number of leaks in the BP network for 2000/1
- More than 1000 overdue inspections

Reliability

- 2002 YTD reliability at TCR is 95.7%, against a Solomon benchmark target of 97.8%
- Reliability is in the lowest percentile of the Solomon EDC6 performance boundaries

Recommendations

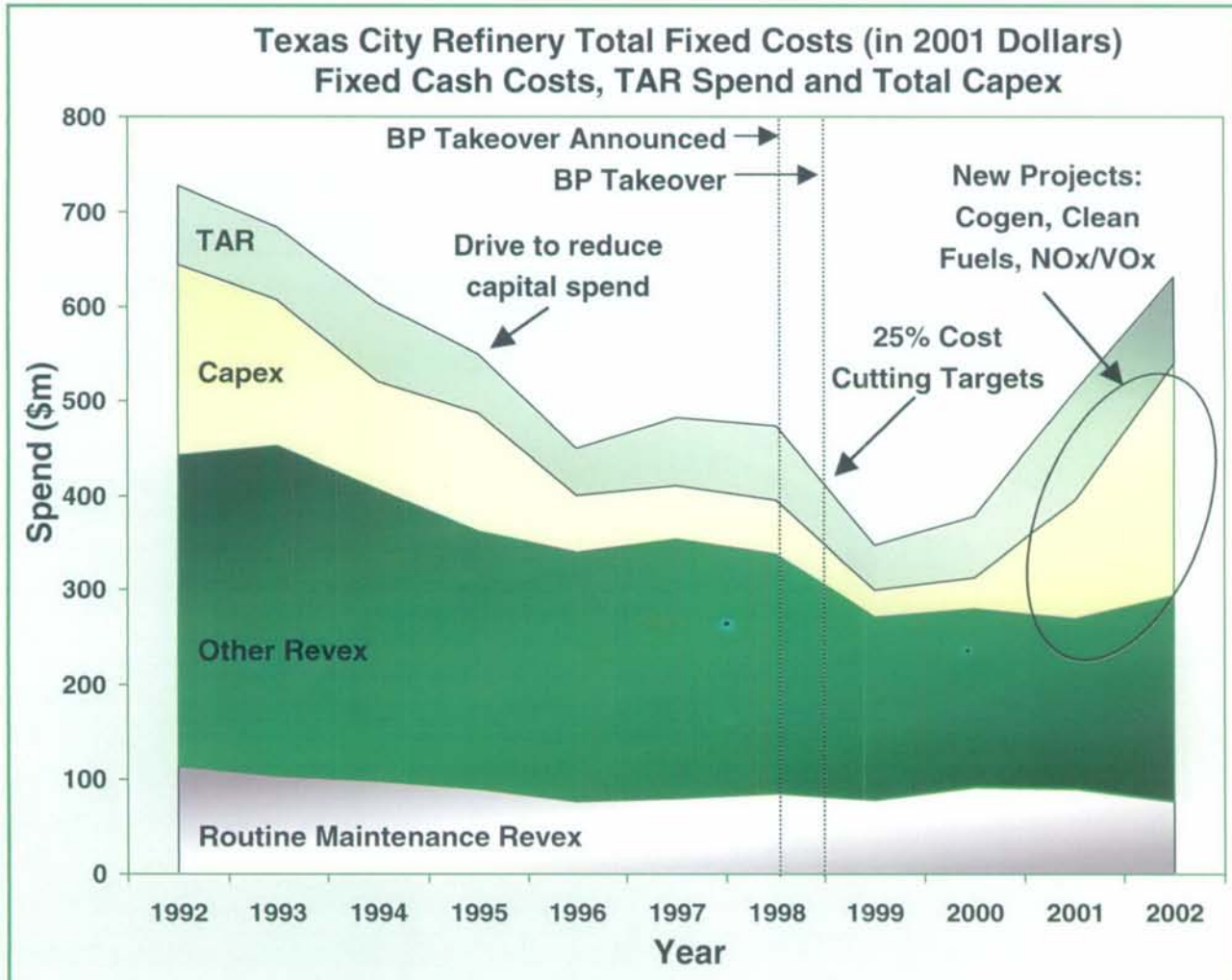
- Execute integrity and infrastructure investment projects - $40m critical and a further $300m potential over the next 5 years (80% of $340m total at TCR)
- Establish ongoing sustaining + HSE capital budget at 1% ERV, once infrastructure investment has been completed
- Fully implement recommendations from piping integrity study
- Reduce (within one year) and maintain overdue license to operate inspections at zero
- Increase and maintain reliability at Solomon top percentile levels through
  - Focusing on manufacturing basics
  - Increasing technical competencies

An independent assessment of causality was initiated

Objectives

1. To seek to understand the historical facts which have led to the deterioration of the Texas City Refinery performance
2. To identify specific cause and effect linkages
3. To identify any learnings which could be transferred across the BP network

There was a consistent and significant reduction in both Revex and Capex Fixed Costs at the refinery between 1992 and 1999



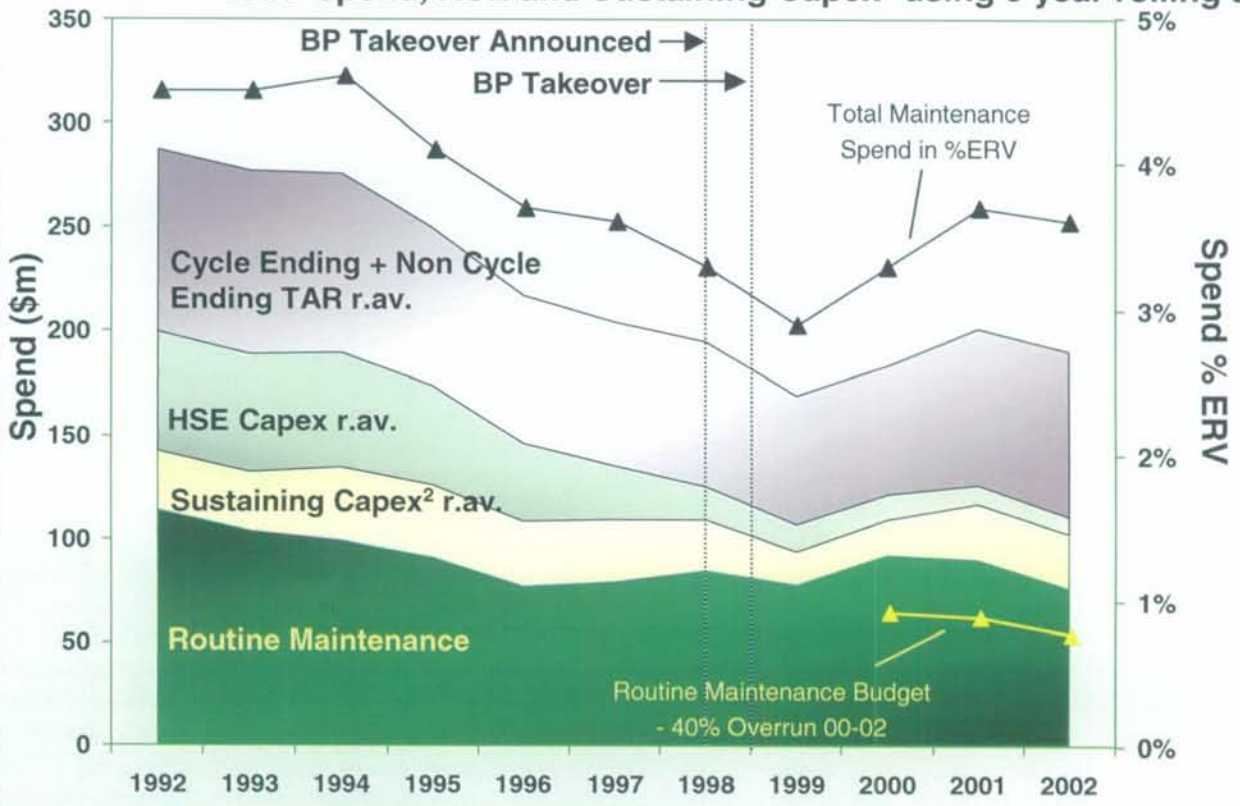
Comments

- Total fixed costs peaked in the early 90s at $727m in 01 equivalent dollars
- By 1999 the total fixed costs had been reduced 52% to $347m
- TAR spend has remained reasonably constant through the period
- Increases in capital spending in 00-02 have been driven by new projects

Source:
BP Financial Data, A.T.Kearney analysis

Total maintenance spend was reduced 41% between 1992 and 1999, driven largely by cutting capex

Total Maintenance spend in 2001 Dollars– Routine Maintenance Fixed Cash Costs, TAR[1] spend, HSE and Sustaining Capex[1] using 5 year rolling averages



Comments

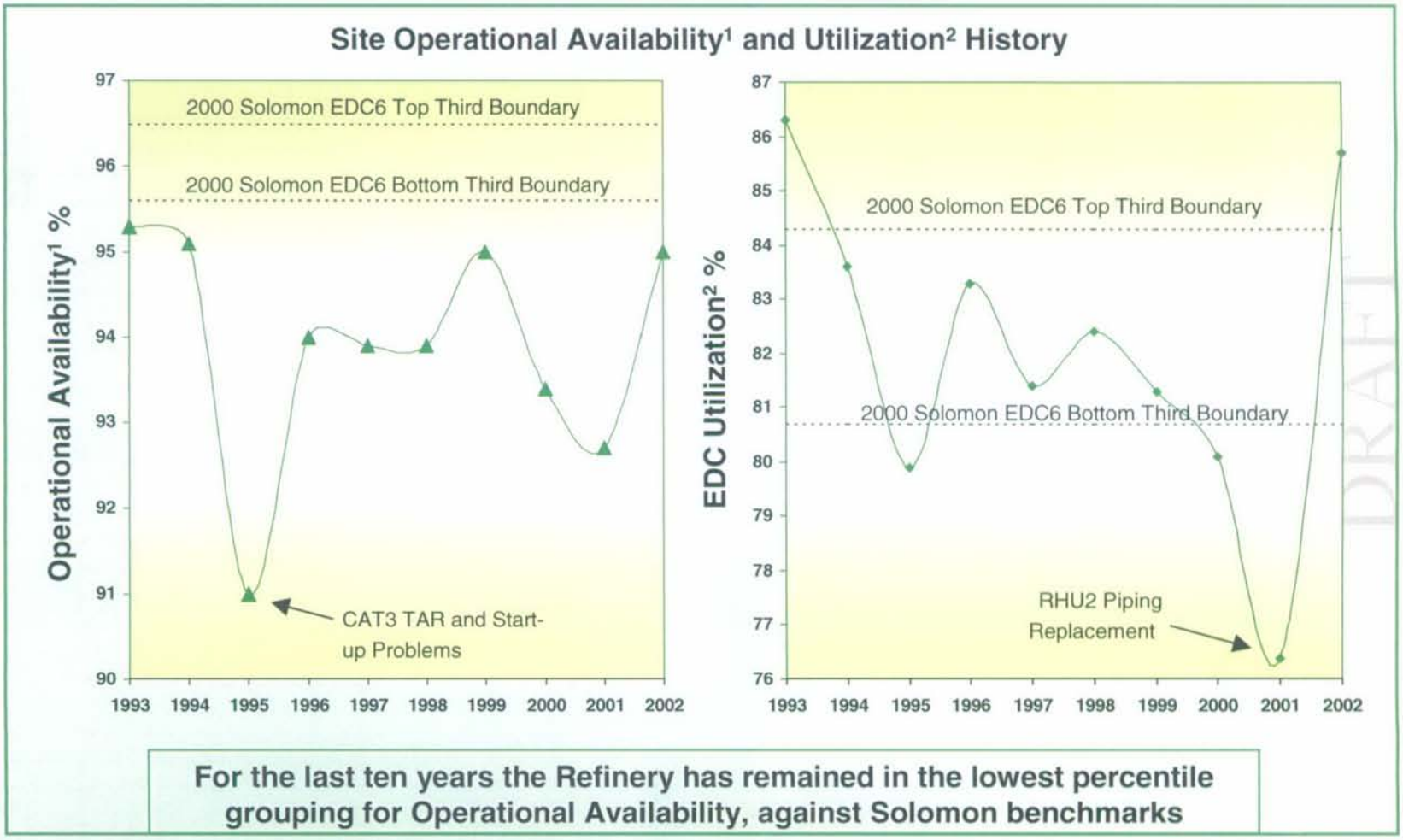
- Maintenance spend, using averages, fell 41% from $287m (4.5% ERV) in 92 to $169m (2.9%) in 99
- HSE+Sustaining capex fell 78% between 1992 and 2002
- Routine maintenance revex fell 33% between 1992 and 2002

Spend increases from 2000 to 2002 are primarily budget overruns resulting from fire-fighting unplanned events

Notes:
1) CE and NCE TAR, HSE and Sustaining Capex calculated as 5 year rolling average. 2) Sustaining Capex does not include new DDU unit in 92

Source:
BP Financial Data, A.T.Kearney analysis

Availability and utilization fell significantly to 2001, before recovering in 2002 (YTD)



Notes:

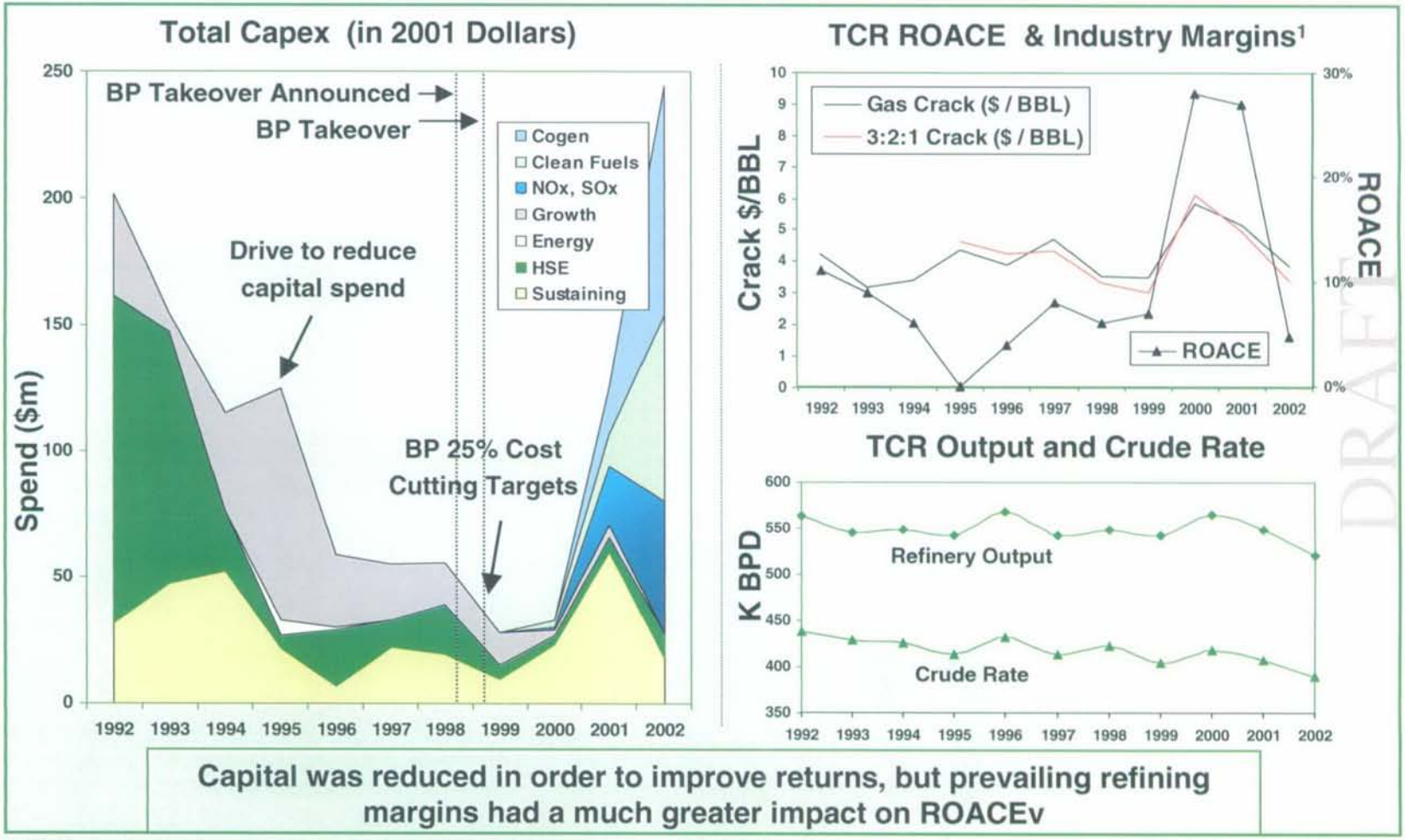
1) Operational Availability Without Slowdowns – Reflects planned and unplanned downtime, Annualized TAR, Regulatory and Process outage

2) Utilization measured as actual calendar day throughput divided by the sum of individual unit capacities multiplied their Solomon complexity factors

Source

Solomon, BP GFO

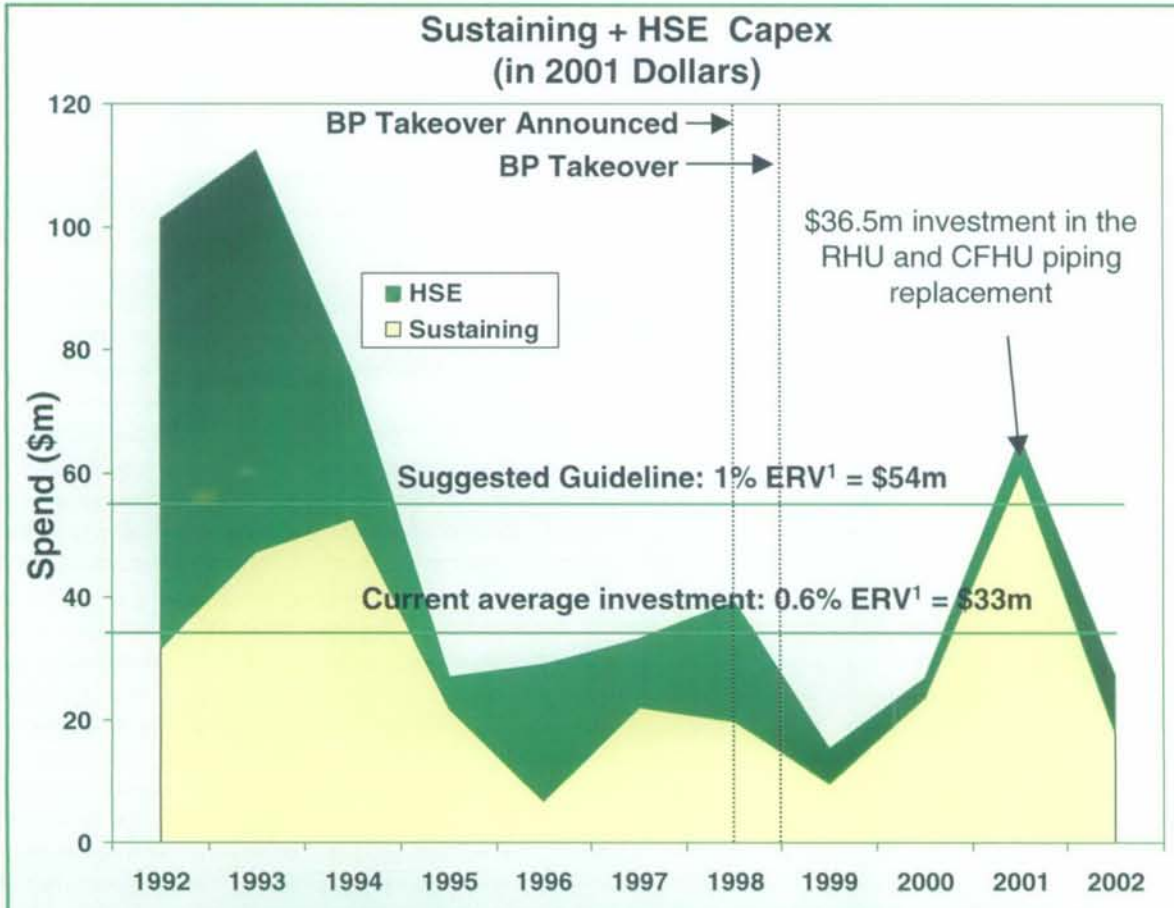
Total capital spending was reduced by 84% from 1992 to 2000



Notes:
1) 3:2:1 Crack =Annual average spot (cash) margin based on refining three barrels of crude to yield two barrels of gasoline and one barrel of diesel
2) Gas Crack = Annual average spot (cash) margin based on refining three barrels of crude to yield three barrels of gasoline
3) Growth Capex spike in 1995 was a $63m investment in a new MSTDP unit

Source:
BP Financial Data, A.T.Kearney analysis

Sustaining and HSE Capex have been reduced significantly, from averaging 1.9% ERV in 92-94, to 0.6% ERV in 95-02



Comments

- The total Sustaining + HSE capital expenditure dropped from an average of 1.9% ERV between 92 and 94, to an average of 0.6% ERV for 1995 to 2002
- HSE Capex fell 87% during the period, from $70m in 1992 to $9m in 2002
- Sustaining Capex fell 66% during the period, from $53mm in 1994 to $18m in 2002

Maintenance Capex budgets for the last 7 years have been significantly below the 1% ERV recommended in the 2002 BPSH assessment

Notes:
1) 2001 ERV $5,444.8m, 2) RHU = Resid Hydrofining Unit 3) CRHU = Cat Feed Hydrofining Unit

Source:
BP Financial Data, A.T.Kearney analysis

Historical data reveals significant reductions in refinery spend with corresponding deterioration in integrity and reliability

- There was a consistent and significant reduction in both Revex and Capex Fixed Costs at the refinery between 1992 and 1999
  - Total maintenance spend was reduced by 41% between 1992 and 1999, driven largely by cutting Sustaining and HSE capex
  - Total capital spending was reduced by 84% from 1992 to 2000
  - Sustaining and HSE Capex have been reduced significantly, from averaging 1.9% ERV in 92-94, to 0.6% ERV in 95-02 and for the last 7 years have been significantly below the 1% ERV guideline suggested in the BPSH assessment
  - Capital was reduced in order to improve returns, but prevailing refining margins had a much greater impact on ROACE
- Routine maintenance spend increases from 2000 to 2002 are primarily budget overruns resulting from fire-fighting unplanned events
- For the last ten years the Refinery has consistently remained in the lowest percentile grouping for Operational Availability against Solomon benchmarks
  - Operational Availability has deteriorated throughout the period, but has recovered in 2002 (YTD) as there have been "no major train wrecks this year"
  - Low Availability and Utilization in 2001/2002 coincided with periods of high refining margins

Anecdotal evidence suggests there was a disconnect between cost reduction programmes and their impact on operations

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- For the last ten years, maintenance budget allocation has been controlled centrally via a "top down" allocation of funds
- Budget cuts were imposed based on the previous years' spend and did not take in to account the specific needs of the refinery
- Prior to 2002 the refinery did not carry out a thorough bottom up analysis of maintenance needs or challenge the budget allocation process
- Evidence from annual performance reports suggests that cost cutting was not carried out as structured, managed and measured process
- There has been no appliance of best practice in order to reach the budget reductions without reducing the level of maintenance work

The prevailing culture at the Texas City Refinery was to accept cost reductions without challenge and not to raise concerns when operational integrity was compromised

The current integrity and reliability issues at TCR are clearly linked to the reduction in maintenance spend over the last decade

- A major reason for the integrity and reliability issues at TCR has been the "top down" approach to cost reduction. There is no evidence to suggest that cost cuts were supported by carefully managed productivity improvement programmes
- The large reduction in Sustaining and HSE capital can be directly linked to the current integrity issues and highlights the imperative to make the proposed remediation investment of $297m at the Texas City Refinery over the next five years
- The fall in reliability over the period is the result of a combination of spend reduction and sub-optimal reliability and maintenance management processes
- High reliability can be consistently attained while maintaining revex costs at current budget levels provided key recommendations from the BPSH assessment are implemented:
  - Improvements in maintenance management processes and implementation of best practices
  - Infrastructure investment and remediation
  - Set on-going maintenance Capex budget at 1% ERV, post infrastructure investment

- In Texas City, our retrospective analysis further supports the need to implement the Site Transformation Program as developed in the 2002 BPSH Best Practices Assessment
- Future maintenance spend optimization should be based on implementation of best practices in maintenance management through structured, managed and measured processes, and should not be driven solely by external benchmarks or across-the-board cost cutting initiatives