

NWCCC - May 30th, 2007

Tesoro Anacortes Refinery:

**The Tesoro TAR Approach & Most
Recent Experience (2006 TAR)**



Turnaround Timing

- ü November 2006 (Structure only)
- ü January 2007 (GE Conflict)
- ü May 2006 (strategic margin window)
- ü November 2006 (Full FCCU 5-yr)

Turnaround Milestones

TURNAROUND MILESTONE STATUS

| Item | Milestone | Target Date (1-26-06) | Actual or Forecast | Ideal Milestone | Variance (days) | | Target Ahead of Oil-Out |
|------|--|--------------------------|-----------------------|--------------------|--------------------|------|----------------------------|
| 1 | Maintain Plant Master T/A Strategy | <i>Evergreen</i> | | | | | |
| 2 | Assign T/A Team - Manager, Planner, Key Members | 1-Mar-06 | 28-Feb-06 | 19-Nov-04 | (466) | 24.0 | 24 Months |
| 3 | Update and Re-Issue Initial Scope, Work List, Capital Budget, Duration | 1-Mar-06 | 1-Mar-06 | 19-Nov-04 | (467) | 24.0 | 24 Months |
| 4 | Submit Phase 1 AFE for Approval | 1-Mar-06 | 31-Aug-05 | 19-Nov-04 | (285) | 24.0 | 24 Months |
| 5 | Strategy Team Set TAR Premises | 1-Mar-06 | 14-Mar-06 | 19-Mar-05 | (360) | 20.0 | 20 Months |
| 6 | Submit Final Engineering Project List With Approved TSWR's & Risk Ranking | 1-Mar-06 | 6-Feb-06 | 19-Mar-05 | (324) | 20.0 | 20 Months |
| 7 | Submit Risk Ranked Work Scope From Ops, Insp, Rel Engr, I&E, & Machinery | 1-Mar-06 | 15-Mar-06 | 19-Mar-05 | (361) | 20.0 | 20 Months |
| 8 | Issue Final Engineering Project List | 1-Mar-06 | 13-Feb-06 | 18-May-05 | (271) | 18.0 | 18 Months |
| 9 | Publish Initial TAR Work List For Prescreen and Initial Risk Assessment | 15-Mar-06 | 1-Apr-06 | 18-May-05 | (318) | 18.0 | 18 Months |
| 10 | Management Approves TAR Contract Strategy | 15-Mar-06 | 14-Mar-06 | 16-Aug-05 | (210) | 15.0 | 15 Months |
| 11 | Freeze TAR Scope and Begin SCO Process | 1-Apr-06 | 1-Apr-06 | 15-Oct-05 | (168) | 13.0 | 13 Months |
| 12 | Assign Operation Support to Develop Work Packages | 1-Apr-06 | 11-May-05 | 14-Nov-05 | 187 | 12.0 | 12 Months |
| 13 | Organization Chart Approved and Issued | 1-Apr-06 | 14-Mar-06 | 14-Nov-05 | (120) | 12.0 | 12 Months |
| 14 | Issue Preliminary Engineering Packages For Planning (includes ALL Capital) | 1-May-06 | 4-May-06 | 14-Mar-06 | (51) | 8.0 | 8 Months |
| 15 | Perform Risk Assessment and Review Preliminary Cost Estimate and Duration | 1-Jun-06 | 12-Jun-06 | 12-Feb-06 | (120) | 9.0 | 9 Months |
| 16 | Key Contract Planners and Schedulers On Site | 1-Jun-06 | 1-Mar-06 | 14-Mar-06 | 13 | 8.0 | 8 Months |
| 17 | Submit Final Funding AFE | 1-Jun-06 | 24-Jun-06 | 14-Mar-06 | (102) | 8.0 | 5 Months |
| 18 | Issue Engineering Packages for Construction (includes ALL Capital) | 1-Jul-06 | 19-Sep-06 | 13-May-06 | (129) | 6.0 | 6 Months |
| 19 | Ops Shut Down, Start Up, and Training Plan Complete and Entered into P3 | 1-Aug-06 | 1-Jul-06 | 13-Apr-06 | (79) | 7.0 | 7 Months |
| 20 | Conduct Peer Review | 15-Sep-06 | 8-Aug-06 | 13-May-06 | (87) | 6.0 | 6 Months |
| 21 | Issue Final Cost Estimate and Resolve Budget Issues | 1-Oct-06 | 1-Aug-06 | 13-May-06 | (80) | 6.0 | 6 Months |
| 22 | Issue Final Critical Path and Manpower Schedule | 1-Oct-06 | 14-Sep-06 | 12-Jun-06 | (94) | 5.0 | 5 Months |
| 23 | Publish Final Work List | 1-Oct-06 | 8-Aug-06 | 13-May-06 | (87) | 6.0 | 6 Months |
| 24 | Identify Field Organizations With Roles and Expectations | 15-Oct-06 | 4-Oct-06 | 11-Aug-06 | (54) | 3.0 | 3 Months |
| 25 | Issue Final Detailed P3 Plan & Schedule | 1-Nov-06 | 21-Sep-06 | 11-Aug-06 | (41) | 3.0 | 3 Months |
| 26 | Final Readiness Review | 1-Nov-06 | 9-Oct-06 | 11-Aug-06 | (59) | 3.0 | 3 Months |
| 27 | Ops Permit & Decon Packages Complete | 1-Oct-06 | 16-Oct-06 | 12-Jul-06 | (96) | 4.0 | 4 Months |
| 28 | All Materials and Outside Fabrication On Site | 15-Oct-06 | 15-Oct-06 | 11-Aug-06 | (65) | 3.0 | 3 Months |
| 29 | Final Mobilization of Contractors and Facilities to Field | 15-Nov-06 | 15-Oct-06 | 10-Sep-06 | (35) | 2.0 | 2 Months |
| 30 | PULL FEED AND START TURNAROUND | 18-Jan-07 | 9-Nov-06 | 9-Nov-06 | 0 | 0.0 | 0 Months |
| 31 | Validate Operating Goals and Premises and Identify Constraints and Action Items | 15-Mar-07 | 15-Jan-07 | 8-Jan-07 | (7) | -1.0 | -1 Months |
| 32 | Evaluate the TAR and Identify Improvement Action Items with Responsible Party and Timing | 15-May-07 | 15-Mar-07 | 9-Mar-07 | (6) | -3.0 | -3 Months |
| 33 | Develop & Issue Base TAR Scope Work List, Capital Budget, & Duration | 15-May-07 | 15-Mar-07 | 9-Mar-07 | (6) | -3.0 | -3 Months |
| 34 | Identify and Order Long Lead Time Equipment | 1-Jun-07 | 1-Apr-07 | 24-Mar-07 | (8) | -3.5 | -3 Months |

| | |
|--|--|
| | Milestone Complete On-Time (Target Met) |
| | Milestone Complete Late (Target Not Met) |
| | Milestone Not Complete (Target In Jeopardy) |
| | Milestone Not Complete /Overdue (Target Not Met) |
| | Milestone Target (Target Date is Achievable) |

PULL FEED AND START TURNAROUND

9-Nov-06

Anacortes November 2006 TAR

Tesoro Turnaround Methodology

Turnaround Scope Development

Risk Assessment

Typical Turnaround Scoping Methods

- § Criticality based
- § Plant practice
- § Legal requirement
- § Company policy
- § Management directive

Weakness of typical scoping methods

- High impact equipment failures are in scope regardless of likelihood of occurrence
- Equipment which may be exposed to harmful substances is in scope regardless of actual damage

The result is more equipment in the turnaround than what needs to be

What is RBSR

- **RBSR** (Risk Based Scope Review) is a structured approach to:
 - § Decide turnaround scope using fact based methods
 - § Improve startup and run-time reliability
 - § Gain buy in to the final turnaround scope

Advantages of RBSR

- Combines consequence and likelihood to get risk.
- Decision to include/exclude is based on level of acceptable risk and mitigation cost (by Group)
- Using advanced RBSR provides the level of precision needed to defer inspections not otherwise deferrable

Matrix Based Risk Assessment

- **STRENGTHS**

- Easily done
- Few resources needed
- Quick

- **WEAKNESSES**

- Very little precision

Matrix Based Risk Assessment

| Annual or event probability | | | Consequence per event | | | | | |
|-----------------------------|--|--|-----------------------|--------------|-------------------------|--------------------------------|-----------------------------|------------------|
| | | | Business | < \$80M | \$80M to \$400M | \$400M to \$2MM | \$2MM to \$10MM | >\$10MM |
| | | | Safety | First Aid(s) | Minor Injury or Illness | Multiple Injuries or Illnesses | Serious Injury or Lost Time | Life Threatening |
| | | | Environmental | Negligible | Minor | Localized | Major | Extensive |
| | | | Reputation | Negligible | Minor | Community | State | National |

| | | | | | | | |
|-----------------|-------------------------------------|---|----------|------------------|------------------|------------------|---------|
| 1.0 to 0.1 | Annually to once in 10 yrs | I (we) would not be surprised to see it happen | < \$80M | \$8000 to \$400M | \$40M to \$2MM | \$200M to \$10MM | >\$1MM |
| 0.1 to 0.01 | Once in 10 to once in 100 yrs | | < \$8000 | \$800 to \$40M | \$4000 to \$200M | \$20M to \$1MM | >\$100M |
| 0.01 to 0.001 | Once in 100 to once in 1,000 yrs | I (we) would think it unusual | < \$800 | \$80 to \$4000 | \$400 to \$20M | \$2000 to \$100M | >\$10M |
| 0.001 to 0.0001 | Once in 1,000 to once in 10,000 yrs | I (we) would be greatly amazed to see it happen | < \$80 | \$8 to \$400 | \$40 to \$2000 | \$200 to \$10M | >\$1000 |
| <0.0001 | Less than once in 10,000 yrs | | < \$8 | \$0.80 to \$40 | \$4 to \$200 | \$20 to \$1000 | >\$100 |

Matrix Based Risk Assessment

| | | | Consequence per event | | | | | |
|-----------------------------|-------------------------------------|---|-----------------------|--------------|-------------------------|--------------------------------|-----------------------------|------------------|
| | | | Business | < \$80M | \$80M to \$400M | \$400M to \$2MM | \$2MM to \$10MM | >\$10MM |
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| | | | Reputation | Negligible | Minor | Community | State | National |
| Annual or event probability | | | | | | | | |
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| 0.001 to 0.0001 | Once in 1,000 to once in 10,000 yrs | I (we) would be greatly amazed to see it happen | | | | \$40 to \$2000 | \$200 to \$10M | >\$1000 |
| <0.0001 | Less than once in 10,000 yrs | | | | | | \$20 to \$1000 | >\$100 |

Range from acceptable risk to high risk. How do we make a decision?

Range from acceptable risk to high risk. How do we make a decision?

Advanced Quantitative Risk Assessment

- **STRENGTHS**

- Much more precise than matrix based

- **WEAKNESSES**

- More time consuming
- More data required

Formal Reviews

- Scope Development (APNetworks)
- First Peer Review (Corporation-wide) – Oct 2005 for May TAR (high risk to accomplish Capital)
- Timing moved to January 2007
- Second Scope Review (included 2008 TAR Inspection Scope & Projects)
- Second Peer Review – Aug 2006 for Nov TAR
- T-Rex (Quality Assurance) – Sept '06

FCCU/ALKY 2nd Peer Review

August '06 for
November 2006 TAR

Anacortes - FCCU/ALKY Peer Review

Purpose of the review is to provide a detailed analysis of critical and near critical paths and identify recommendations to reduce these durations

Units Involved

– Zone B

Cat Cracker:

- FCCU Structure; Fractionation
- Gas Recovery; Treeters; Sour Water Treating
- Alky

– Zone A

- Parts of All Hydro-processing units
- DHT/CGS/CR-NHT/CFH
- ROSE; Jet Treater (Carbon Replacement)

– Zone C

- Flare area and Cooling Water Towers

Turnaround Process & Mechanical Drivers

- FCCU and Alky ran **55 months** – previous best is 43 months.
- The primary driver for work was **equipment condition**.
 - Flue Gas Line replacement
 - No.1 Fractionator plugging
 - F-301 Feed Pre-Heater convection section
 - Dry Gas Treater rate limits
 - Light ends treater plugging
- The secondary driver was equipment **inspection** requirements.
- The scope was challenged using a risk-based matrix

Maintenance Scope

| Areas | COL | EXCH -Fin Fans | VSL | PSV | I/E | ROTATING | PIPING | VLVS | MISC Cwt./Thrd, TW's, TKS |
|----------------------|-----|----------------------|-----|-----|---------|----------|--------|------|---------------------------------|
| ALKY | 0 | 27/0 | 15 | 3 | 49 | 2 | 24 | 74 | 0/29/3 |
| FCCU | 12 | 80/0 | 35 | 2 | 57 | 7 | 41 | 58 | 0/267/2 |
| Hydro- Processing | 5 | 23/6 | 5 | 1 | 9 | 5 | 5 | 27 | 0 |
| Utilities | 0 | 0 | 0 | 0 | 0 | 0 | 5 | 2 | 3/1/0 |
| Totals | 17 | 130/6 | 55 | 6 | 10 6 | 7 | 75 | 163 | 3/297/5 |

Capital Scope

- § #1 Riser Feed Nozzles
- § WGC Dry Gas Seal/Rotor Up-Grades
- § Tandem Butterfly Replacement
- § Flue Gas Line Replacement (40%)
- § Convection Section of Feed Heater
- § Woodward Governors – WGC, J-901, J-902
- § Upsize Internals for RA & Debut Columns
- § C-505/506 Structured Packing internals
- § LGO Pump-around Tie-ins
- § Coker Project Tie-ins

Contracting Strategy – Geographic Area

- Cust-O-Fab (InServ) was responsible for the FCCU Structure Area and Feed furnaces. Specialty Welding services throughout.
- Matrix had responsibility for the Utilities, all Hydro-processing Units, were sub Contractor to Tesoro Maintenance in the Alky area. Also had scope for COB & Utilities, bundle slab and transportation of all bundles to and from all units.
- J.V. Industrial had the responsibility for the FCCU – Gas Plant, Fractionation and Treaters areas.
- The Column Contractor was Sulzer-Canatex to do all Nozzle and Retray replacements, and other work related to the internal of the columns within the process areas.

Contractor Management

- PSM Orientations
- Background Checks
- PICS
- TWIC (future)

TAR - High Level Status (2nd Peer)

- Status of Work Package Planning
 - 3 General Contractors on-site
 - All long lead item materials are confirmed
- Status of Engineering / Construction Packages
 - All packages IFC'd by July '06
- Project and Turnaround Team is integrated work group in Anacortes

Review Critical Path

- **FCCU**
 - Replacement of Y-Section
 - Replacement of Flue Gas Line & Tandem Butterfly Valves
 - Retray of C-401 & C-403
 - WGC Overhaul and Projects
- **Alky-Utilities**
 - Non-Critical
- **CR**
 - J6650 Turbine Balance lines replacement
 - Replacement of E6651 Fix Tube Bundles & Shells
- **CGS**
 - Retubing of Overhead Fin Fans (2) of 6

Anacortes 2nd Peer Review

August 2006

Opportunities

- Only 92 Work Days Remaining to Oil Out
- Capital Uncertainties (w/turnaround scope)
 - Ø Selective Hydrogenation tie ins
 - Ø SRU versus Gas Pipeline – Need Decision
 - Ø Coker Cancelled (Amine II) – Reconcile tie-ins
- 45 Control valves in current scope – onstream opportunities

Anacortes Peer Review

August 2006

Recommendations

Planning:

- **Fully incorporate all capital work into the plan (see capital uncertainties)**
- **Significantly behind – manpower loaded schedules. Operations plan (S/D & S/U) is not finalized**
- **Schedule need more internal scrutiny - nearly 3 day potential identified, depending upon availability of equipment**

Anacortes Peer Review

August 2006

Recommendations -

- **WGC plan is missing details for Tesoro programming resource, I/E contractor plan and commissioning plan – committed to final schedule by 8/23/06**
- **Need better plan for I/E on Capital work in general**
- **Complete “Insp discovery” @ TAR 30%**
- **Re-examine TAR milestones to assure completion and develop recovery plan**

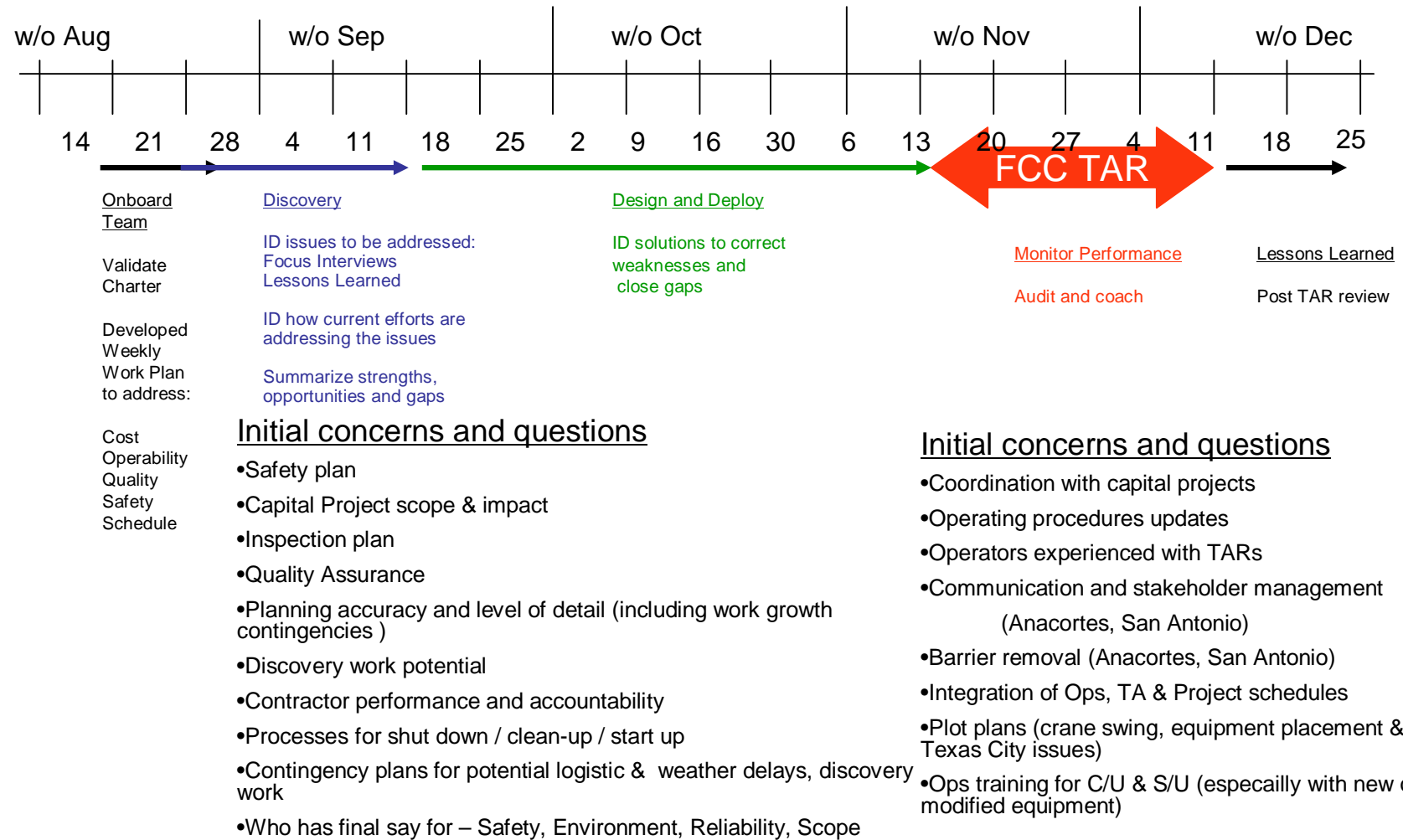
TREX Presentation to the SMT

September 18, 2006

Turnaround Excellence Team



FCC TAR Excellence – Key Activities



Anacortes November 2006 TAR

Results




Ron's Flat Top 2006 TAR



Anacortes November 2006 TAR

Key Performance Indicators

- Plan
- Actual

| | Cat Cracker | Alky Unit & Utilities | ZONE A |
|---|----------------------|-----------------------|----------------------|
| Zero Lost Time injuries | zero | zero | zero |
| Zero OSHA Recordables | zero | zero | zero |
| Zero Environmental incidents or community complaints | zero | zero | zero |
| No Fires | zero | zero | zero |
| No Leaks - Quality Startup  | zero | zero | zero |
| Ensure reporting of all first aid and near miss occurrences | 1/5,000 mnhr | 1/5,000 mnhr | 1/5,000 mnhr |
| Ensure Safety & Environmental Audits occur on each shift | Global Audit/Shift | Global Audit/Shift | Global Audit/Shift |
| Meet or improve schedule compliance | +/- hrs against plan | +/- hrs against plan | +/- hrs against plan |
| | | | |

NOTE 1: No leaks that require unit slowdown or other negative impact on the start-up progress.

| | Cat Cracker | Alky Unit & Utilities | ZONE A |
|---|-------------|-----------------------|--------|
| Zero Lost Time injuries | zero | zero | zero |
| Zero OSHA Recordables | zero | zero | zero |
| Zero Environmental incidents or community complaints | zero | zero | zero |
| No Fires | zero | zero | zero |
| No Leaks - Quality Startup | zero | zero | zero |
| Ensure reporting of all first aid and near miss occurrences | 50 | 14 | 16 |
| Ensure Safety & Environmental Audits occur on each shift | 80 | 40 | 45 |
| Meet or improve schedule compliance (behind) | (36) | (24) | (12) |
| | | | |

Anacortes – CCU/Alky TAR 2006

Major Work Accomplished

- Replaced cracked FGL & installed hi-temp B-fly valves
 - Replaced #1 Riser Wye & installed new feed system
 - Rebuilt all 12 secondary regenerator cyclones
 - Major repairs on #1 Reactor separator & cyclones
 - Major upgrade of Wet Gas Compressor
 - Major rebuild of CR Recycle Compressor heads
 - C-507 Column - bottom replacement
-
- ~450,000 manhours worked during T/A phase
 - 38,500 MH's discovery work vs. 21,000 MH's planned



Anacortes – CCU/Alky TAR 2006



Weather

- First ever Anacortes CCU TAR during Nov/Dec
- All time record rainfall for the month of November
- Hurricane force winds (twice) forced work stoppage
- Chronic high winds impacted ~12 shifts of crane use/plans
- Snow/ice impacted the work site and (days) of commutes
- Temps at night generally in low 30s
- Weather related impacts were ~ 6 days



Anacortes November 2006 TAR

Daily Status Reporting



Tesoro Anacortes Refinery

Report Printed:

Fall 2006 Major Turnaround
Daily T/A Report
Report Data Date: 12/13/06

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HSE Information

| | Last 24 Hours | Turnaround to Date |
|--|---------------|--------------------|
| First Aid Cases | 0 | 84 |
| OSHA Recordable | 0 | 2 |
| Lost Time Incidents | 0 | 0 |
| Safety Audits and Observations Completed | 3 | 311 |
| Community Complaints | 0 | 0 |
| Reportable Environmental Incidents | 0 | 0 |

Comments:

SAFETY

Securing materials and equipment in preparation for high winds, up to 90mph. High wind warning in effect for the next 24 hours.
First Aid - Zero in the last 24 hours.

Audits

Documentation - Reviewed supervisors entry permit log, accurate and complete.
Execution - Observed several scaffold removal projects, all employees using proper PPE.
Training - Checked forklift operators for training cards/certificates, acceptable.

ENVIRONMENTAL

No issues or concerns.

Unit Audits:

Cat Cracker

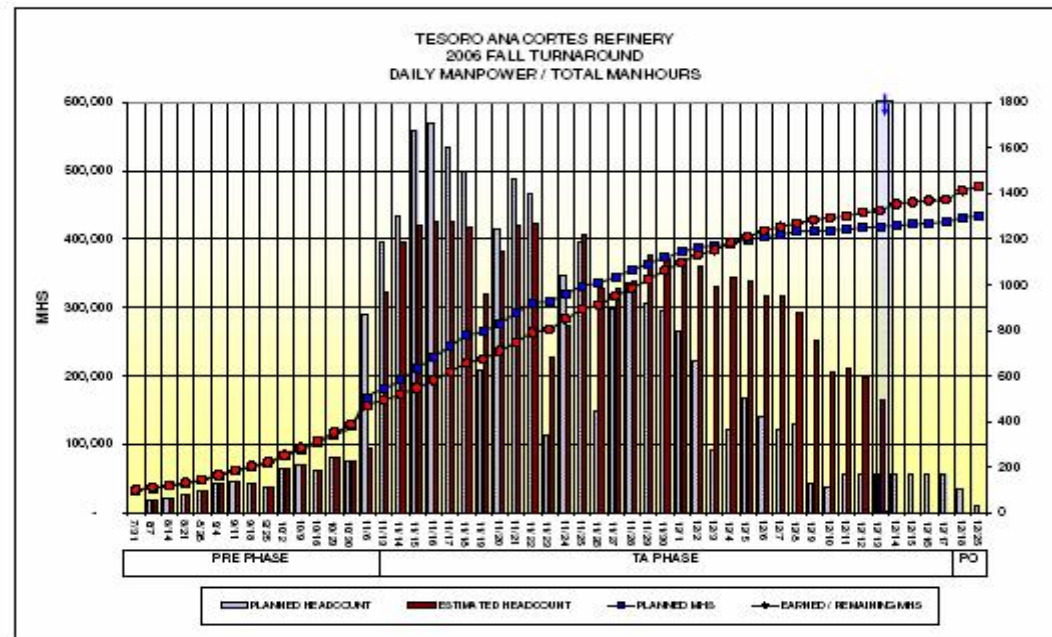
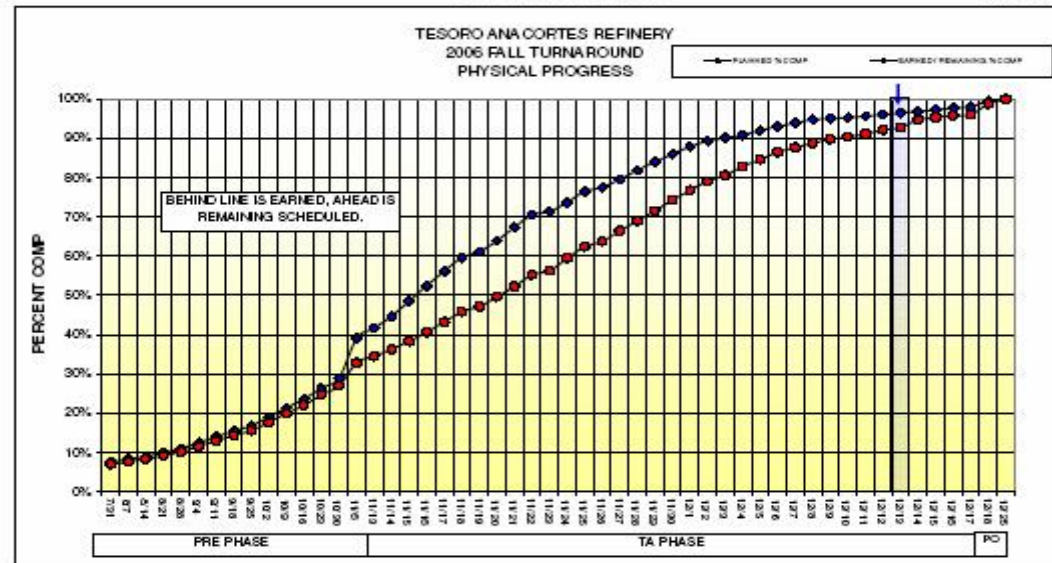
All equipment closed, no entries remaining. Flange torquing in progress, cold and hot settings. Fire proofing complete, structural steel and platforms restored. Flue Gas Line has one manway open for internal inspection and setting of the tandem butterfly valves.
Operations pressure testing the unit and releasing blinds. Scheduled start up 12-17, day shift.

Alky Unit

Completing compressor work by 12-15. Control valves installed and being tested. Pulling blinds, 11 remaining.

A Zone

Jet Treater - Blinds installed opening equipment, installing scaffolding.
DHT - Unit pressure tested, circulating feed.



* First Week on Chart has all pre work to date rolled up



Tesoro Anacortes Refinery Fall 2006 Major Turnaround

Report Printed: 12/15/06 12:00 AM

Daily T/A Report
Report Data Date: 12/13/06

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Cost Information

| A/E Header | Project Description | A/E Budget (Millions) | Contractors Orig Budget | Approved 2007's | Available Contingency | Funding Requested | Budget at Completion | To Date Incurred Costs | Forecast @ Completion |
|---|---|-----------------------|-------------------------|-----------------|-----------------------|-------------------|----------------------|------------------------|-----------------------|
| Entire Refinery Outage | | | | | | | | | |
| DTPND.0600.2005.03 | RCO / CGS / ROSE / GRI / TREATERS | 24.50 | 18.67 | 2.12 | 0.50 | 0.00 | 21.28 | 20.85 | 24.00 |
| DTPND.0600.2006.02 | ALKY / UTILITIES | 6.00 | 4.38 | (0.11) | 0.25 | 0.00 | 4.52 | 5.50 | 5.75 |
| DTPND.0600.2006.03 | ORI / NAT / DMT / JT | 2.60 | 2.15 | 0.08 | 0.00 | 0.00 | 2.23 | 2.63 | 2.60 |
| Entire Refinery Outage | | 33.10 | 25.20 | 2.09 | 0.75 | 0.00 | 28.04 | 29.08 | 32.35 |
| Engineering Projects | | | | | | | | | |
| 052100016 | FRI CONVECTION SECTION REPL | 1.30 | 0.95 | 0.07 | (0.07) | 0.00 | 0.95 | 1.26 | 1.37 |
| 052100029 | WGC WOODWARD GOV UPGRD | 0.77 | 0.75 | 0.05 | (0.03) | 0.00 | 0.78 | 0.58 | 0.70 |
| 052100030 | ALKY COMPRESSORS GOV UPGRD | 1.14 | 1.00 | 0.08 | 0.00 | 0.00 | 1.08 | 0.82 | 1.14 |
| 052100031 | #1 FEED RISER | 4.30 | 3.00 | 0.05 | 0.00 | 0.00 | 3.05 | 3.75 | 4.30 |
| 052100034 | WGC ROTORS & DRY SEALS | 6.78 | 6.50 | 0.10 | (0.12) | 0.00 | 6.48 | 7.07 | 6.90 |
| 052100037 | ALKY ACID INSTRUMENTATION UPGRD | 0.33 | 0.32 | 0.03 | (0.03) | 0.00 | 0.32 | 0.26 | 0.36 |
| 055100039 | FUEL GAS LINE REPL / BUTTERFLY VLVS | 3.14 | 3.00 | 0.02 | (0.22) | 0.00 | 2.81 | 2.92 | 3.36 |
| 055100076 | CGS / CGS PACKING PROJECT | 0.51 | 0.50 | 0.03 | 0.00 | 0.00 | 0.53 | 0.39 | 0.51 |
| 062100001 | #1 FRACTIONATOR - LGO PUMPAROUND | 3.22 | 3.00 | 0.19 | (0.04) | 0.00 | 3.14 | 3.01 | 3.26 |
| 062100004 | RCO INSTRUMENTATION UPGRD | 0.51 | 0.50 | 0.07 | (0.01) | 0.00 | 0.56 | 0.45 | 0.52 |
| 062100023 | RA & DEBUT COLUMN INTERNALS UPGRD | 1.24 | 1.10 | 0.03 | 0.04 | 0.00 | 1.17 | 0.77 | 1.20 |
| 062100029 | ALKY COMPRESSOR LUBE SYSTEM IMPROVMENTS | 0.20 | 0.20 | 0.06 | 0.00 | 0.00 | 0.25 | 0.21 | 0.20 |
| 064100006 | CCU H2O PUMP SYSTEM UPGRD | 0.08 | 0.08 | 0.00 | 0.00 | 0.00 | 0.08 | 0.08 | 0.08 |
| Engineering Projects | | 23.51 | 20.90 | 0.78 | (0.48) | 0.00 | 21.21 | 21.67 | 23.99 |
| Fall 2006 Major Turnaround Cost Information: | | | | | | | | | |
| | | 68.61 | 46.10 | 2.87 | 0.27 | 0.00 | 49.24 | 60.64 | 68.34 |

NOTES:

1. PRE T/A STARTED on 8/1/2006
2. AVAILABLE CONTINGENCY IS FOR DISCOVERY WORK & LABOR PRODUCTIVITY.



Tesoro Anacortes Refinery

Report Printed:

Fall 2006 Major Turnaround
Daily T/A Report

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Schedule Performance Information Cumulative To Date

| | Target % Complete | Earned % Complete | Current Schedule | Actual To Date | Current Earned | PF (E/A) |
|----------------|-------------------|-------------------|------------------|----------------|----------------|----------|
| Turnaround MHS | 96% | 92% | 329,003 | 331,929 | 303,492 | 0.91 |
| Capital MHS | 97% | 94% | 147,776 | 120,005 | 138,547 | 1.15 |

Note: Actual MHS are just based on Contractors and AFEs in Master Schedule.

Milestone Dates

| Unit | Pull Feed | | | | | Finish Maintenance | | | | | Product On Spec | | | | |
|----------------------|-----------|-------|-------------------|-------|-------|--------------------|-------|-------------------|-------|-------|-----------------|-------|-------------------|-------|-------|
| | Planned | | Actual / Forecast | | Var | Planned | | Actual / Forecast | | Var | Planned | | Actual / Forecast | | Var |
| | Date | Time | Date | Time | Hrs | Date | Time | Date | Time | Hrs | Date | Time | Date | Time | Hrs |
| ALKY | 11/10 | 7:00 | 11/10 | 7:00 | 0 | 12/10 | 7:00 | 12/15 | 3:00 | (116) | 12/11 | 7:00 | 12/16 | 3:00 | (116) |
| CFH | 11/8 | 8:00 | 11/8 | 8:00 | 0 | 12/2 | 22:00 | 12/2 | 19:00 | 3 | 12/2 | 22:00 | 12/7 | 12:00 | (110) |
| CCS | 11/9 | 7:00 | 11/9 | 10:00 | (3) | 12/11 | 7:00 | 12/15 | 7:00 | (96) | 12/12 | 15:00 | 12/17 | 16:00 | (121) |
| CR | 11/13 | 12:00 | 11/13 | 4:00 | 8 | 11/30 | 7:00 | 11/30 | 7:00 | 0 | 12/2 | 5:00 | 12/4 | 16:59 | (60) |
| HHT | 11/12 | 6:00 | 11/12 | 6:00 | 0 | 12/1 | 7:00 | 11/30 | 10:00 | 21 | 12/4 | 11:00 | 12/7 | 6:00 | (67) |
| DHT | 11/11 | 8:00 | 11/11 | 8:00 | 0 | 12/2 | 7:00 | 12/14 | 13:00 | (294) | 12/5 | 11:00 | 12/14 | 0:00 | (229) |
| CCU- GAS RECOVERY | 11/9 | 7:00 | 11/9 | 10:00 | (3) | 12/5 | 7:00 | 12/16 | 4:00 | (261) | 12/12 | 7:00 | 12/20 | 6:00 | (191) |
| CCU- TREATERS | 11/9 | 7:00 | 11/9 | 10:00 | (3) | 12/5 | 12:00 | 12/14 | 11:00 | (220) | 12/12 | 7:00 | 12/20 | 6:00 | (191) |
| CCU- STRUCTURE | 11/9 | 7:00 | 11/9 | 10:00 | (3) | 12/11 | 5:00 | 12/16 | 21:00 | (136) | 12/12 | 7:00 | 12/20 | 6:00 | (191) |
| CCU- FRACS | 11/9 | 7:00 | 11/9 | 10:00 | (3) | 12/5 | 7:00 | 12/16 | 4:00 | (261) | 12/12 | 7:00 | 12/20 | 6:00 | (191) |
| ROSE | 11/8 | 12:00 | 11/8 | 12:00 | 0 | 12/11 | 7:00 | 12/9 | 0:00 | 33 | 12/13 | 11:00 | 12/17 | 7:00 | (92) |
| JFT | 12/4 | 10:00 | 12/14 | 10:00 | (240) | 12/12 | 2:00 | 12/22 | 1:00 | (251) | 12/13 | 7:00 | 12/22 | 19:00 | (227) |
| | | | | | | | | | | | | | | | |
| Data as of 9/12/2006 | | | | | | | | | | | | | | | |

Key Equipment Progress Scoreboard

| | Cry/ Es | Not Started | Working | Initial Inspection | Final Inspection | Complete |
|----------------------|---------|-------------|---------|--------------------|------------------|----------|
| Columns / Vessels - | 87 | 1 | 2 | 64 | 64 | 64 |
| Exchangers - | 109 | 0 | 0 | 109 | 109 | 109 |
| Rotating Equipment - | 8 | 0 | 0 | 8 | 8 | 8 |
| Control Valves - | 85 | 0 | 12 | 85 | 53 | 53 |
| Hoppers - | 2 | 0 | 0 | 2 | 2 | 2 |

* Moved to Daily T/A

Rotating Equipment is Compressors, Blowers, Pumps & Motors

Anacortes – CCU/Alky TAR 2006

Safety & Environmental

- 2 Recordable Injuries for turnaround RIR of 0.9 (everyone on site)
- Zero environmental issues
- ~450,000 manhours worked during T/A phase

Budget

| | <u>AFE</u> | <u>Forecast</u> |
|----------------------|------------------|------------------|
| Turnaround AFEs | \$33.1 MM | \$36.0 MM |
| T/A Capital Projects | <u>\$23.6 MM</u> | <u>\$23.8 MM</u> |
| Total Spend | \$56.7 MM | \$59.8 MM |

TAR Schedule

- 41 day TAR duration (plan was 35 days)
- Planned - Oil out Nov 9th; product on-spec December 14th
- Actual - Oil out Nov 9th; product on-spec December 20th



Anacortes in November







Keys to Success?

- Early Contractor Selection
- Planners in Early (onsite 12 months & critical path well planned)
- Contractor Scope of Responsibility by Geographic Area (didn't overload capability)
- Materials on-site when needed
- Engineering Work Packages out early
- All work was in the plan and scheduled
- Met pre-TAR goals & pulled TAR hours into Pre-TAR (10,000)

Keys to Success?

- Tower Crane (permanent base)
- Chemical Cleaning
- Fallback Resource Plan
 - ü PSF on C-507
 - ü PMNW Responded for Freeze issues
 - ü Busload of Gulf Coast Welders
- Moved Waste to Perimeter for pick-up
- Remote Medical (on-site Physicians Assistants)
- Operations Support (cradle to grave)

Opportunities

- Long Range TAR/Capital Strategy and Vision – timing changes
- Shutdown & Start-up Plan/Schedule was overly optimistic – manpower impact
- Inspection Resources – became critical
- Project Controls – timely submittals; correct invoicing
- Control Budgets for all Contractors

Questions?

