STRATEGIC PETROLEUM RESERVE

ENGINEERING CHANGE PROPOSAL

SUMMARY SHEET
CLASS I CHANGE

ECP NUMBER	TITLE
SJ-M/O-4624	**Sugarland Tank API-653 Inspection and Repairs**

BUDGET SOURCE	AUTHORITY	
☐ SPR BLI ____ ☐ CONTRACTOR BASELINE ☐ BCR ☐ OTHER	☐ PCCB ☐ ECC SCHEDULE ☐ YES MILESTONE NUMBER ____ CMCR NUMBER ____ ☐ NO	TOTAL ESTIMATED COST OF CHANGE **TOTAL** **$780,000**

PCCB / ECC SIGNATURES	DISPOSITION			COMMENTS CONDITIONS / LIMITATIONS
	CONCUR	NON CONCUR	DATE	
DOE SENIOR SITE OFFICIAL				Ongoing.
E. N. Kelly APM TECHNICAL ASSURANCE			3/16/04	
Warner Powell APM SYSTEMS AND PROJECTS	✓		16 MARCH 2004	
L Gale Mc APM MAINTENANCE AND OPERATIONS	✓		3/15/04	
Michael McCurdy APM MANAGEMENT AND ADMINISTRATION	✓		3/17/04	
DEPUTY PROJECT MANAGER				
DOE CMO				
PROJECT MANAGER				
DEPUTY ASSISTANT SECRETARY -SPR				

PCCB / ECC ACTION		
☑ FULL APPROVAL	☐ CONDITIONAL / LIMITED APPROVAL	☐ DISAPPROVAL

NUMBER: SJ-M10-4624

TITLE: **Sugarland Tank 4 API-653 Inspection and Repairs**

EXECUTIVE SUMMARY:

Sugarland Tank 4 must be inspected per DOT CFR 195.432 using methods prescribed by API 653.

IMPLEMENTATION PLAN:

The expected start date for the project is early 2nd Quarter 2004 with completion in approximately three months. The project start time is dependent on terminal utilization. The project start time is dependent on terminal utilization and completion is dependent on the required repairs.

IMPLEMENTATION COST:

$780,000

DESIGN:
CONSTRUCTION:

TOTAL:

LIFE CYCLE COST:

Replacement of the drain assembly, roof legs, roof sleeves, and mechanical repairs that will extend the servicable life of Tank 4 for twenty years will be performed.

IMPACT SUMMARY:

LEVEL I, II, III CRITERIA:

CODES, REGULATIONS, PERMITS, ETC.:

SAFETY, ENVIRONMENTAL, FIRE PROTECTION SYSTEMS, SECURITY:

CONTRACT COMPLETION DATES:

GFE:

SCHEDULES:

STRATEGIC PETROLEUM RESERVE

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ENGINEERING CHANGE PROPOSAL

ECP NUMBER	ECP TITLE			PAGE 1 OF 4
SJ-M10-4624	Sugarland Tank 4 API-653 Inspection and Repairs			
CONTRACTOR CHANGE NO./REV.	INITIATED BY Doug Cloud	DATE 11/24/2003	SUBMITTED BY Terry Coleman	DATE
PRIORITY ☐ EMERGENCY ☐ URGENT ☒ ROUTINE	ORG./CONTRACTOR Shell Pipeline Co.,	PHONE NO. 728-3573	ORG./CONTRACTOR Shell Pipeline Co.,	PHONE NO. 728-7366
	VALUE ENGINEERING ☐ VEP (MANDATORY) ☐ VECP (VOLUNTARY)	DRAWDOWN CRITICAL ☐ YES ☐ NO	ROM ESTIMATE $ 780,000	

DESCRIPTION:

PROBLEM / EXISTING CONFIGURATION **Sugarland Tank 4 must be inspected per DOT CFR 195.432 using methods prescribed by API 653.**

ROPOSED SOLUTION / ENHANCEMENT **Tank 4 will be taken out of service, cleaned, internally inspected via the API 653 standard, repaired as warranted, and returned to service as more thoroughly described in Attachment A.**

The expected start date for the project is early 2nd Quarter 2004 with completion in approximately three months. The project start time is dependent on terminal utilization and completion is dependent on the required repairs.

REASON / JUSTIFICATION **Inspection and repairs are necessary to meet DOT requirements per CFR 195.432. Addditionally replacement of the drain assembly, roof legs, roof sleeves, and mechanical repairs that will extend the servicable life of Tank 4 for twenty years will be performed. Every attempt will be made to increase the working volume of the tank by removing restrictions, shortening the low leg settings, etc.**

CI'S AFFECTED

TECHNCIAL ANALYSIS/RECOMMENDATION			IMPLEMENTATION METHOD
			☐ SUBCONTRACT ☐ M&O LABOR (LOE) ☐ COMBINATION
ENGINEERING	DATE	DOE SSR	DATE ☐ CONCUR ☐ NONCONCUR

D-655

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STRATEGIC PETROLEUM RESERVE
ENGINEERING CHANGE PROPOSAL
CONFIGURATION CHANGE AFFECTED REPORT

WR #

TO BE COMPLETED BY TECHNICAL REVIEW PROCESS, ENGINEERING AND CONFIGURATION MANAGEMENT ORGANIZATION DEFINED PROCESS

ECP NO.	CONRACTOR CHANGE NO.	REV.	CHANGE CLASSIFICATION ☒ CLASS I ☐ CLASS II	PAGE 2 OF
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FUNCTIONS AFFECTED

YES/NO	ITEM
YES	LEVEL I ☐ LEVEL II ☐ CRITERIA
NONO	PERFORMANCE CRITERIA
NONO	RAM
NONO	INTERFACE CHARCTERISTICS
NONO	I/O POINTS
NONO	DOE LEVEL I, II, III SCHEDULES
NONO	GUARANTEES/DELIVERABLES
NONO	SAFETY/ENV/FP (CIRCLE ONE)
NONO	SECURITY REQUIREMENTS
NONO	OPCS SOFTWARE
NONO	OPCS HARDWARE
NONO	OPCS FIRMWARE
NONO	SETPOINTS/RANGES
NONO	DIP SWITCH SETTINGS/JUMPERS
NONO	MASTER CI LIST
NONO	WELLHEAD CONFIGURATION
NONO	SPARES/ROVISIONING REQUIREMENTS
NONO	GOVERNMENT FURNISHED EQUIPMENT
NONO	ENERGY USAGE
ONO	OPERATIONS MODESL
YESNO	OTHER

DOCUMENTS AFFECTED

YES/NO	ITEMS
	PIPING
NONO	101 - PROCESS FLOW DIAGRAMS
NONO	102 - MECHANICAL FLOW DIAGRAMS
NOYES	103 - PIPING AND INSTRUMENTATION DIAGRAMS (P&ID'S)
NONO	104 - UTILITY FLOW DIAGRAMS
YESNO	105 - GENERAL PIPING PLANS
NONO	106 - AREA PLANS (MECHANICAL EQUIPMENT LOCATION)
NOYES	122 - WELL HEAD DRAWINGS
NONO	130 - VALVE LIST
NONO	135 - LINE LIST
NONO	140 - PSV LIST
NONO	150 - STANDARDS
	CIVIL/STRUCTURAL
NONO	201 - PLOT PLANS
NONO	202 - SITE WORK: GRADING (ROUGH & FINISH) DRAIN FENCING
NONO	210 - FOUNDATIONS: LOCATION PLANS
NONO	216 - MINES (WEEKS ISLAND ONLY)
NONO	250 - STANDARDS
	ELECTRICAL
NONO	301 - AREA CLASSIFICATION
NONO	302 - ONE LINE DIAGRAMS
NONO	303 - SCHEMATIC DIAGRAMS
NONO	304 - POWER PLAND AND DETAILS
NONO	305 - LIGHTING PLAND AND DETAILS
NONO	307 - SUBSTATION PLANS AND DETAILS
NONO	308 - WIRING DIAGRAMS
ONO	310 - GROUNDING
NONO	311 - CONDUIT & CABLE SCHEDULES (INCLUDING INST.)
NONO	313 - MCC/SWITHC GEAR EVALUATION & SCHEDULE

DOCUMENTS AFFECTED

YES/NO	ITEM
	ELECTRICAL (cont'd)
NONO	315 - CATHODIC PROTECTION
NONO	350 - STANDARDS
	INSTRUMENTATION
NONO	401 - BLOCK DIAGRAM
NONO	402 - LOOP DIAGRAMS
NONO	403 - INSTRUMENT PLANS
NONO	404 - INSTRUMENT WIRING DIAGRAM
NONO	409 - INSTRUMENT INDEX
NONO	450 - STANDARDS
	MAPPING
NONO	501 - ALIGNMENT SHEETS
NONO	509 - PIPELINE DRWGS (MAINLINE VALVES, DRIPS, SCRAPER, TRAPS, ETC.)
NONO	550 - STANDARDS
	ARCHITECTUAL
NONO	720 - ELEVATIONS AND FLOOR PLANS
NONO	750 - STANDARDS
	DOCUMENTATION
NONO	900 - RESERVED
NONO	901 - TECHNICAL/PERFORMANCE/DESIGN CRITERIA
NONO	910 - DESIGN DESCRIPTION/BASIS
NONO	911 - PROCESS SET POINT DOCUMENTS
NONO	912 - EQUIPMENT LIST
NONO	913 - MOV LIST
NONO	915 - ELECTRICAL SAFETY
NONO	920 - I/O DOCUMENT
NOYES	930 - OPERATIONS MANUALS
NONO	930 - MAINTENANCE MANUALS
NONO	950 - STANDARD SPECIFICATIONS
NONO	970 - TASK SPECIFICATIONS
NO	990 - CONFIGURATION MANAGEMENT REPORTS/I.B.M.

COMENTS:

ENGINEERING	DATE	CONFIGURATION MANAGEMENT	DATE

STRATEGIC PETROLEUM RESERVE

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ENGINEERING CHANGE PROPOSAL

SOFTWARE, HARDWARE, FIRMWARE CHANGE

CONTRACTOR CHANGE NUMBER	REVISION NUMBER	ECP NUMBER	PAGE
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SOFTWARE CHANGE ANALYSIS	HARDWARE/SOFTWARE AFFECTED (NOTE: REDLINE CI BOM)

DISPOSITION OF PARTS

☐ REWORK SITE COMPONENTS ONLY ☐ REWORK ALL SITE COMPONENTS ☐ COMPONENTS NOT AFFECTED

☐ OTHER (DESCRIBE)

COMPONENT COMPATIBILITY (LIST COMPONENTS SEPERATELY IF COMPATIBILITIES ARE DIFFERENT)

☐ INTERCHANGEABLE ☐ DRAWDOWN COMPATIBLE ☐ NONCOMPATIBLE

OPCS SUPPORT ENGINEER DATE FUNCTIONAL MANAGER DATE

IMPLEMENTATION / TEST COMMENTS

WITNESSED BY	DATE

Attachment A

Sugarland/ St. James Terminal Tank Inspection & Repair Criteria

All Sugarland tanks at St. James will be internally inspected via the American Petroleum Institute's (API) 653 Standard by the spring of 2009. This 2009 period is based on the Department of Transportation's (DOT) adoption of the API-653 Standard in 1999. This inspection includes a 100% Magnetic Flux Exclusion (MFE) floor scan performed by certified personnel. Each tank will be repaired to a level such that it will not need to be taken out of service for another API-653 Inspection for 20 years. Each tank will also be upgraded to conform to the latest Environmental Protection Agency's (EPA) emission standards.

Floor – The floor has a thin film epoxy coating nominally 20 mils thick. The floor will be MFE scanned through the existing coating over 100% of its entire surface. Floor areas that have a metal loss of 50% or greater will be patched, welded, or cut out and replaced. New patch welds will be vacuum boxed or dye penetrant tested to assure weld penetration. The floor coating will be repaired following any mechanical repairs. Existing floor seams will be visually inspected before recoating. The interior floor-to-shell weld will be magnetic particle tested before recoating. The exterior floor-to-shell weld will be abrasive-blast cleaned to be visually inspected. All new floor welds will be magnetic particle tested before recoating. The floor sump will be inspected by Ultrasonic Thickness (UT) testing and its welds will be magnetic particle tested.

Shell – All new and existing welds at the nozzles, manways, and appurtenances will be magnetic particle tested. If an existing shell material is not known, a hardness or chemical analysis test will be performed to check the material for weldability before installing door sheets, manways, piping, etc.

Roof – All buckles, sags, and/or birdbaths in the pan will be removed or tightened during the repair stage of the roof work. New weld seams will be tested by a diesel check or magnetic particle test. The leg sleeves will be UT'd and evaluated for thinning metal; questionable sleeves will be coated internally and/or replaced. All roof legs will be upgraded to galvanized schedule 80 pipe with end caps. The leg striker plates will not be welded to the floor but will be ½"x20"x20". All vapor spaces will be UT'd, repaired, and if necessary coated. Following the final raising of the roof by hydraulic jacks, the roof pontoon welds will be inspected. The vacuum breakers will be resized and refitted for the new low leg setting.

The outside rim space bulkhead will be inspected for metal loss, cracks, holes, screws with grommets, or any other anomalies. The existing roof drain system will be upgraded. Following the upgrade of the roof drain system, the entire system will be pressure tested. The roof sump check valve will be replaced and

a vent tap will be added to prevent an air lock. The main drain will be increased to 6-inch and the auxiliary to 4-inch.

Rolling Roof Ladder – The entire ladder will be inspected thoroughly including axles, wheels, anchor bolts, pins, clips, and steps. If the tank fill height or low leg setting is changed, the length of the ladder rail may need to be adjusted.

Tank Valve (at shell) The valve will be inspected, and repaired as warranted.

Cathodic Protection – The Cathodic Protection (CP) will be verified at spots throughout the tank.

Additional Items: The geometry of the tank will be evaluated to determine if an increase to the working volume of the tank is warranted (i.e. removing restrictions, shortening the low leg setting, etc.).

The tank will be re-strapped before being returned to service.

C. Tank 4 API 653 Inspection, Repairs, and Modifications

Problem / Existing Configuration

- Tank 4 must be inspected per DOT CFR 195.432 using methods prescribed by API 653.

Proposed Solution / Enhancement

- Tank 4 will be taken out of service, cleaned, internally inspected via the API 653 standard, repaired as warranted, and returned to service.
- Anticipated start date is early 2nd quarter 2004.
- Anticipated length of project is 3 months.
- The drain assembly, roof legs, roof sleeves, and mechanical repairs will be completed to extend the service life for twenty years.
- *The tank will be examined to determine if removing restrictions or shortening* the low leg setting can increase the working volume.

Reason / Justification

- Inspection and repairs are necessary to meet DOT CFR 195.432.