STRATEGIC PETROLEUM RESERVE

ENGINEERING CHANGE PROPOSAL

SUMMARY SHEET
CLASS I CHANGE

ECP NUMBER	TITLE
SJ-M/O-4627	**Replace GE THED Breakers on Lighting Circuits**

BUDGET SOURCE

- ☐ SPR BLI ____
- ☐ CONTRACTOR BASELINE
- ☐ BCR
- ☐ OTHER

AUTHORITY

☐ PCCB ☐ ECC

SCHEDULE

☐ YES
MILESTONE NUMBER ____
CMCR NUMBER ____
☐ NO

TOTAL ESTIMATED COST OF CHANGE

	FY	FY	FY
DESIGN	$1,000	____	____
CONSTRUCTION/M&O	$5,000	____	____
TOTAL	$6,000	____	____

PCCB / ECC SIGNATURES	DISPOSITION: CONCUR	NON CONCUR	DATE	COMMENTS CONDITIONS / LIMITATIONS
DOE SENIOR SITE OFFICIAL	✓		3/17/04	See Centra 2000 Report. use CMO
E. A. Kelly APM TECHNICAL ASSURANCE	✓		4-19-04	
(for [illegible]) APM SYSTEMS AND PROJECTS	✓		4/14/04	
Lionel Gale APM MAINTENANCE AND OPERATIONS	✓		3/14/04	
Michael McNeill APM MANAGEMENT AND ADMINISTRATION	✓		4/23/04	
DEPUTY PROJECT MANAGER				
DOE CMO				
PROJECT MANAGER				
DEPUTY ASSISTANT SECRETARY -SPR				

PCCB / ECC ACTION

☑ FULL APPROVAL ☐ CONDITIONAL / LIMITED APPROVAL ☐ DISAPPROVAL

NUMBER: SJ-M/O-4627
TITLE: **Replace GE THED Breakers in Lighting Circuits**

EXECUTIVE SUMMARY:
The GE THED breakers do not provide instantaneous overload current protection for the lighting circuits. The lighting circuits are susceptible to lightening strikes which causes process interuptions. The breakers will be replace with Spectra Series 30 breakers.

IMPLEMENTATION PLAN:
1. **Identify MCC lighting circuits that also contain process equipment.**
2. **Purchase Spectra Series 30 Breakers**
3. **Schedule installation. (No process shutdown is required).**

IMPLEMENTATION COST:
$6,000

DESIGN: $1,000
CONSTRUCTION: $5,000

TOTAL: $6,000

LIFE CYCLE COST:

IMPACT SUMMARY:

LEVEL I, II, III CRITERIA:

CONTRACT COMPLETION DATES:

CODES, REGULATIONS, PERMITS, ETC.:

GFE:

SAFETY, ENVIRONMENTAL, FIRE PROTECTION SYSTEMS, SECURITY:

SCHEDULES:

STRATEGIC PETROLEUM RESERVE

WR #

ENGINEERING CHANGE PROPOSAL

ECP NUMBER	ECP TITLE			PAGE 1 OF 4
SJ-M10-4627	**Replace GE THED Breakers on Lighting**			
CONTRACTOR CHANGE NO./REV.	INITIATED BY **Troy Lambert**	DATE **11/24/2003**	SUBMITTED BY **Terry Coleman**	DATE
PRIORITY ☐ EMERGENCY ☐ URGENT ☒ ROUTINE	ORG./CONTRACTOR **Shell Pipeline Co.,**	PHONE NO. **265-4712**	ORG./CONTRACTOR **Shell Pipeline Co.,**	PHONE NO. **728-7366**
	VALUE ENGINEERING ☐ VEP (MANDATORY) ☐ VECP (VOLUNTARY)	DRAWDOWN CRITICAL ☐ YES ☐ NO	ROM ESTIMATE **$ 6,000**	

DESCRIPTION:

PROBLEM / EXISTING CONFIGURATION **The GE THED breakers do not provide instantaneous overload current protection for the lighting circuits. The lighting circuits are susceptible to lightening strikes which causes process interuptions.**

ROPOSED SOLUTION / ENHANCEMENT **Replace the GE THED breaks with Spectra 30 series breakers.**

REASON / JUSTIFICATION **Increase the reliability of the facility by reducing the weather related impact. See attachment A for further technical justification.**

CI'S AFFECTED

TECHNCIAL ANALYSIS/RECOMMENDATION

IMPLEMENTATION METHOD
☐ SUBCONTRACT
☐ M&O LABOR (LOE)
☐ COMBINATION

ENGINEERING	DATE	DOE SSR	DATE
J. P. Martinez	2/19/04		☐ CONCUR ☐ NONCONCUR

D-655

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STRATEGIC PETROLEUM RESERVE
ENGINEERING CHANGE PROPOSAL
CONFIGURATION CHANGE AFFECTED REPORT

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

ECP NO.	CONTRACTOR CHANGE NO.	REV.	CHANGE CLASSIFICATION	PAGE 2 OF ___
SJ-M/O-4627		0	☒ CLASS I ☐ CLASS II	

FUNCTIONS AFFECTED		DOCUMENTS AFFECTED	
YES/NO	ITEM	YES/NO	ITEM
NO	**LEVEL I ☐ LEVEL II ☐ LEVEL III CRITERIA**		**ELECTRICAL (cont'd)**
NO	PERFORMANCE CRITERIA	NO	308 - WIRING DIAGRAMS
NO	RAM	NO	310 - GROUNDING
NO	INTERFACE CHARACTERISTICS	NO	311 - CONDUIT & CABLE SCHEDULES (INCLUDING INST.)
NO	I/O POINTS	NO	313 - MCC/SWITCH GEAR ELEVATION & SCHEDULE
NO	DOE LEVEL I, II, III SCHEDULES	NO	315 - CATHODIC PROTECTION
NO	GUARANTEES/DELIVERABLES	NO	350 - STANDARDS
NO	SAFETY/ENV/FP (CIRCLE ONE)		**INSTRUMENTATION**
NO	SECURITY REQUIREMENTS	NO	401 - BLOCK DIAGRAM
NO	OPCS SOFTWARE	NO	402 - LOOP DIAGRAMS
NO	OPCS HARDWARE	NO	403 - INSTRUMENT PLANS AND DETAILS
NO	OPCS FIRMWARE	NO	404 - INSTRUMENT WIRING DIAGRAM
NO	SETPOINTS/RANGES	NO	409 - INSTRUMENT INDEX
NO	DIP SWITCH SETTINGS/JUMPERS	NO	450 - STANDARDS
NO	MASTER CI LIST		**MAPPING**
NO	WELLHEAD CONFIGURATION	NO	501 - ALIGNMENT SHEETS
NO	SPARES/PROVISIONING REQUIREMENTS	NO	509 - PIPELINE DRWGS (MAINLINE VALVES, DRIPS, SCRAPER, TRAPS, ETC.)
NO	GOVERNMENT FURNISHED EQUIPMENT	NO	550 - STANDARDS
NO	ENERGY USAGE		**ARCHITECTURAL**
NO	OPERATIONS MODELS	NO	720 - ELEVATIONS AND FLOOR PLANS
NO	OTHER	NO	750 - STANDARDS
	DOCUMENTS AFFECTED		**DOCUMENTATION**
	ITEMS	NO	900 - RESERVED
	PIPING	NO	901 - TECHNICAL/PERFORMANCE/DESIGN CRITERIA
NO	101 - PROCESS FLOW DIAGRAMS	NO	910 - DESIGN DESCRIPTION/BASIS
NO	102 - MECHANICAL FLOW DIAGRAMS	NO	911 - PROCESS SET POINT DOCUMENTS
NO	103 - PIPING AND INSTRUMENTATION DIAGRAMS (P&ID'S)	NO	912 - EQUIPMENT LIST
NO	104 - UTILITY FLOW DIAGRAMS	NO	913 - MOV LIST
NO	105 - GENERAL PIPING PLANS	NO	915 - ELECTRICAL SAFETY
NO	106 - AREA PLANS (MECHANICAL EQUIPMENT LOCATION)	NO	920 - I/O DOCUMENT
NO	122 - WELL HEAD DRAWINGS	NO	930 - OPERATIONS MANUALS
NO	123 – WELL COMPLETION CONFIGURATION DRWGS	NO	930 - MAINTENANCE MANUALS
NO	130 - VALVE LIST	NO	950 - STANDARD SPECIFICATIONS
NO	135 - LINE LIST	NO	970 - TASK SPECIFICATIONS
NO	140 - PSV LIST	NO	990 - CONFIGURATION MANAGEMENT REPORTS/I.B.O.M.
NO	150 - STANDARDS		
	CIVIL/STRUCTURAL	COMMENTS:	
NO	201 - PLOT PLANS		
NO	202 - SITE WORK: GRADING (ROUGH & FINISH) DRAIN FENCING		
NO	210 - FOUNDATIONS: LOCATION PLANS		
NO	216 - MINES (WEEKS ISLAND ONLY)		
NO	250 - STANDARDS		
	ELECTRICAL		
NO	301 - AREA CLASSIFICATION		
NO	302 - ONE LINE DIAGRAMS		
NO	303 - SCHEMATIC DIAGRAMS		
NO	304 - POWER PLANS AND DETAILS		
NO	305 - LIGHTING PLANS AND DETAILS		
NO	307 - SUBSTATION PLANS AND DETAILS		
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 3 OF

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"

Technical Justification for Replacement of GE THED Breakers in Lighting Circuits

On the afternoon of September 26, 2003, a severe lightning storm affected Sugarland Facility/ St. James Terminal. Lightning contacted an overhead lighting pole in the pig trap/ water separation area. This lighting circuit (6020) is fed from MCC-6. Also contained in MCC-6 are circuits supplying power for the wastewater treatment system. In addition to the lighting, the equipment supplied is:

- SJTP 15A, B, and C Lift Station Pumps (Circuit 6040)
- SJTP 16A and B Oil Sump Pumps (Circuit 6041)
- SJTP 17A and B Skimmer Pumps (Circuit 6015)
- SJTP 18A, B, and C Effluent Sump Pumps

During the storm, pumps SJTP-15 A &B and SJTP-16A &B failed to start due to a trip of the main breaker (circuit 6033) for MCC-6. The main breaker is a 600-amp HMPC type breaker that has an instantaneous trip setting. When lightning hit, the 480v lighting circuit was shorted phase to phase, tripping the 600-amp main. When the 600-amp main tripped, power was disconnected to all wastewater treatment equipment.

When investigating why the 30-amp lighting circuit did not trip before the 600-amp main, it was found that the 30-amp lighting breaker is of the G.E. THED type. This breaker is thermal magnetic with no adjustable instantaneous trip. The manufacturer, G.E., indicated the breaker is designed for thermal over-current protection in motor circuits and is not recommended for lighting circuits. According to the breaker trip curves, this type of breaker has a wide instantaneous trip rating that varies from breaker to breaker, depending on the manufacturing process. Stringent manufacturing controls are not required for the recommended application. According to the trip curves, the breaker installed has an instantaneous trip rating between 375 amps and 1,500 amps. The manufacturer's recommendation is to replace the THED breaker with a Spectra E-Frame Breaker Module # SEDA36AT0030 with 30 amp rating plugs. These breakers are designed to trip on instantaneous current overload.

The bolt patterns are the same and the retrofit should be easily accomplished. The THED type breakers used in lighting applications with process equipment in the same MCC will be replaced throughout the facility.

E. Replace GE THED Breakers

Problem / Existing Configuration

- The installed breakers did not provide instantaneous overload current protection for the lighting circuits.
- The lighting circuits are susceptible to lightening strikes

Proposed Solution / Enhancement

- Replaced the GE THED breakers with Spectra 30 series breakers.

Reason / Justification

- Increase the reliability of the facility by minimizing weather related impact.