

PROPOSED

FY 2009

**NON-ROUTINE
MAINTENANCE
LIST**

May 22, 2008

May 2008		Proposed FY09 List of Hydropower Work Packages for Integrated System																		
District	SWPA Region Priority	Project Name	Work Package Description	Totals		FY09		FY10		FY11		FY12		FY13		FY14		MW AT RISK	Estimated Economic Risk (\$1,000)	Cost Savings (\$1,000)
				Pkg Tot (\$1000)	Cum (\$1,000)	Ant. Expend.	Cum (\$1,000)													
SWL-01	1	Ozark	FY 2008 Rehabilitation Funding (FY 09 - FY 12 Work Plan)	84,000	84,000	17,300	17,300	17,000	17,000	14,000	14,000	0	0	0	0	0	0	100		
SWF-01	2	Whitney	Turbine and Generator Rehabilitation (FY 09 - FY 12 Work Plan)	22,700	106,700	5,130	22,430	5,550	22,550	3,990	17,990	3,000	3,000	0	0	0	0	30		
NWK-01	3	Truman	Inspection and Repair of Draft Tube Bulkheads, Cylinder Hoists, and Liner and Cavitation Damage (FY 05 & FY 06 Consolidated Project)	6,105	112,805	500	22,930	1,165	23,715	1,000	18,990	500	3,500	0	0	0	0	30	965/unit	
SWL-02	4	Little Rock District	Replace SCADA - To be Compatible with Centralized Control (FY 06 Project)	4,230	117,035	1,500	24,430		23,715		18,990		3,500	0	0	0	0	129	360	
MVK-01	5	DeGray	Rewind Units (FY 08 Budget & FY 09 Work Plan)	9,500	126,535	5,000	29,430		23,715		18,990		3,500	0	0	0	0	40	4,181	
SWT-01	6	Webbers Falls	Generator Rewind (FY 08 Project)	6,000	132,535	2,000	31,430	2,000	25,715		18,990		3,500	0	0	0	0	6	8,362	
SWT-02	7	Webbers Falls	Miscellaneous Electrical & Mechanical Rehabilitation Work (FY 08 Project)	3,500	136,035	500	31,930	2,000	27,715	500	19,490		3,500	0	0	0	0	6	2,508	
SWT-03	8	Broken Bow	Transformer Oil Containment	400	136,435	400	32,330		27,715		19,490		3,500	0	0	0	0	50	3,015	
SWT-04	9	Tenkiller	Transformer Oil Containment	400	136,835	400	32,730		27,715		19,490		3,500	0	0	0	0	19	1,176	
SWT-05	10	R.S. Kerr Lock And Dam	Rehab Intake and draft tube gates	1,600	138,435	550	33,280	1,050	28,765		19,490		3,500	0	0	0	0	27	221	2/year
SWT-06	11	Ft. Gibson Lake	Replace sump pumps, piping and valves	300	138,735	300	33,580		28,765		19,490		3,500	0	0	0	0	11	90	
SWL-03	12	Norfolk	Rehabilitate Station Sump System, pumps, and associated piping	500	139,235	500	34,080		28,765		19,490		3,500	0	0	0	0	40	161	
MVS-01	13	Cannon	Recondition Low Voltage Circuit Breakers	185	139,420	185	34,265		28,765		19,490		3,500	0	0	0	0	27	217	
SWT-07	14	Denison	Rehab Draft tube gates and intake gate hoists	400	139,820	400	34,665		28,765		19,490		3,500	0	0	0	0	35	141	
SWL-04	15	Greers Ferry	Replace Generator Air Coolers	550	140,370	550	35,215		28,765		19,490		3,500	0	0	0	0	48	772	
SWT-08	16	R.S. Kerr Lock And Dam	Replace 13.8 KV Breakers	350	140,720	350	35,565		28,765		19,490		3,500	0	0	0	0	27	221	
SWL-05	17	Bull Shoals	Replace Station Service Batteries	75	140,795	75	35,640		28,765		19,490		3,500	0	0	0	0	340	182	

May 2008

Proposed FY 09 Work Packages													
District	SWPA Region Priority	PROJECT NAME	Work Package Description	RELIABILITY	EFFICIENCY	SAFETY	COST SAVINGS	ENVIRONMENTAL	FORCED OUTAGE	PREVENTATIVE MAINTENANCE	OBSOLETE	NERC COMPLIANCE	MW AT RISK
SWL-01	1	Ozark	FY 2008 Rehabilitation Funding (FY 09 - FY 12 Work Plan)	X	X					X	X		100
SWF-01	2	Whitney	Turbine and Generator Rehabilitation (FY 09 - FY 12 Work Plan)	X	X					X	X		30
NWK-01	3	Truman	Inspection and Repair of Draft Tube Bulkheads, Cylinder Hoists, and Liner and Cavitation Damage (FY 05 & FY 06 Consolidated Project)	X		X	X	X		X			30
SWL-02	4	Little Rock District	Replace SCADA - To be Compatible with Centralized Control (FY 06 Project)	X			X			X	X		129
MVK-01	5	DeGray	Rewind Units (FY 08 Budget & FY 09 Work Plan)	X	X					XX	X		40
SWT-01	6	Webbers Falls	Generator Rewind (FY 08 Project)	X	X					X	X		6
SWT-02	7	Webbers Falls	Miscellaneous Electrical & Mechanical Rehabilitation Work (FY 08 Project)	X	X					X	X		6
SWT-03	8	Broken Bow	Transformer Oil Containment	X				X	X				50
SWT-04	9	Tenkiller	Transformer Oil Containment	X				X	X				19
SWT-05	10	R.S. Kerr Lock And Dam	Rehab Intake and draft tube gates	X						X			27
SWT-06	11	Ft. Gibson Lake	Replace sump pumps, piping and valves	X						X	X		11
SWL-03	12	Norfolk	Rehabilitate Station Sump System, pumps, and associated piping	X						X	X		40
MVS-01	13	Cannon	Recondition Low Voltage Circuit Breakers	X	X						X		27
SWT-07	14	Denison	Rehab Draft tube gates and intake gate hoists	X						X			35
SWL-04	15	Greers Ferry	Replace Generator Air Coolers	X						X			48
SWT-08	16	R.S. Kerr Lock And Dam	Replace 13.8 KV Breakers	X						X	X		27
SWL-05	17	Bull Shoals	Replace Station Service Batteries	X							X		340

Work/Funding Timeline: Rehabilitate Turbines 1 – 5 from May 2005 through May 2012 for \$84,000,000.

Estimated Losses in Revenue/Benefits/Risk Factor: : Eventual failure of the generating units will result if rehabilitation is not completed.

Summary of Funding Argument(s):

- Rehabilitation will result in increased reliability.
- Timely repair with minimal interruption of service.
- Reduced likelihood of major failure.

Photographs: None.

Information Data Sheet for Customer Funding

Hydropower Plant: Whitney Run of River _____ Storage X
District: Fort Worth
No. of Units: 2 Capacity of Units (MW) (Overload) 30 (34) MW
Estimated Average Annual (MWH) (SWPA Annual Report) 73,000 MWh

Current Status of Project: Both units are available. The plant is 52 years old.

Item Proposed for Customer Funding: Replacement of both turbines, rewinding of both generators and replacement and upgrading of peripheral electrical and mechanical systems such as governors, excitors, coolers, controls, etc. (turbine, generator and associated equipment rehabilitation).

Reason for Item:

<input checked="" type="checkbox"/> Reliability	<input type="checkbox"/> Environmental
<input checked="" type="checkbox"/> Efficiency	<input type="checkbox"/> Forced Outage
<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Preventative Maintenance
<input type="checkbox"/> Cost Savings	<input checked="" type="checkbox"/> Obsolete
<input type="checkbox"/> NERC Compliance	

History of Outages/Deficiency: The rehabilitation of Whitney Powerhouse is discussed in the study and report approved by Headquarters in July 2001.

Solution: The contract for replacement of the turbines and rewinding of the generators was awarded in May 2007. The base bid was awarded for \$3.3 million. Continued funding for the remaining four options will be required to complete the contract. Performance of the contract options will take four to five years.

Scope of Work: Continued execution of the existing Turbine/Generator Contract.

Total Estimated Cost: \$22,700,000 over 5 years.

Costs/Impacts if Item is Not Funded:

- 1) Megawatts and Energy at Risk: 30 MW
- 2) Environmental Risk: None
- 3) Cost Savings: Delays in funding of the remaining options will cause possible termination of the contract and increased costs for delays and re-procurement of the contract.
- 4) Other: Eventual failure of the units due to increased age and usage will be the result if the rehabilitation of the turbines and generators are not completed.

Work/Funding Timeline:

<u>Activity Item</u>	<u>Time frame</u>	<u>Dollars</u>
Award of base bid	May 07	3,300,000
Award of Option 1	Feb 08	4,300,000
Award of Option 2	Feb 09	4,300,000
Award of Option 3	Feb 10	4,600,000
Award of Option 4	Feb 11	3,600,000
Award of optional items	Feb 08 – Feb11	2,600,000

Estimated Losses in Revenue/Benefits/Risk Factor: Eventual failure of the generating units will result if rehabilitation is not completed.

Summary of Funding Argument(s):

- Units are past their designed life.
- Rehabilitation will result in increased reliability.
- Increased power production due to up-rating of the rehabbed units.
- Increase unit reliability and availability.

Information Data Sheet for Customer Funding

Hydropower Plant: Harry S. Truman **Run of River** X **Storage**
District: Kansas City
No. of Units: 6 **Capacity of Units (MW) (Overload)** 160 (180) MW
Estimated Average Annual (MWH) (SWPA Annual Report) 244,000 MWh

Current Status of Project: All six units are currently available.

Item Proposed for Customer Funding: Inspection and Repair of Draft Tube Bulkheads, Cylinder Hoists, and Liner and Cavitation Damage.

Reason for Item:

- | | |
|---------------------------|---------------------------------------|
| <u> X </u> Reliability | <u> X </u> Environmental |
| <u> </u> Efficiency | <u> </u> Forced Outage |
| <u> X </u> Safety | <u> X </u> Preventative Maintenance |
| <u> X </u> Cost Savings | <u> </u> Obsolete |
| <u> </u> NERC Compliance | |

History of Outages/Deficiency: The draft tube liners are fabricated of carbon steel and are subject to corrosion and cavitation damage. The water at the project is highly corrosive and is detrimental to the liner, turbines, and structural supports resulting in corrosion damage and measurable reductions in unit efficiency. Sand blasting and vinyl painting of the liners will stop or greatly reduce the corrosive effect of the lake water, increase efficiency, and significantly reduce annual outage times by minimizing the amount of future cavitation repair work. Unit 6 was painted in 1993, but some repairs will be required to the existing vinyl paint. In order to perform the liner corrosion and cavitation repair work, the draft tube bulkheads will need to be inspected and repaired (if required) in accordance with Corps of Engineers' (COE) criteria outlined in Engineering Regulation (ER) 1110-2-8157, Responsibility for Hydraulic Steel Structures (HSS). ER 1110-2-8157 requires all HSS (bulkheads, stoplogs, gates, etc.) to receive a full initial inspection and follow-up periodic inspections every 25 years. The purpose of these inspections is to ensure the bulkheads are structurally sound and safe to use before Government or contractor personnel enter a dewatered area to perform maintenance or repair work. To ensure compliance with the ER and provide safety for Government and contractor personnel, a qualified structural engineer must inspect the bulkheads, determine their safety, and document the inspections. Structural and/or weld defects found during the inspections must be repaired before the bulkheads can be certified for use. The hydraulic power units and cylinders will have to be dismantled so the bulkheads can be removed from their slots and placed on the draft tube deck for these inspections. The operating stems and eye ends of the hydraulically operated draft tube bulkhead hoists (total of 12 hydraulic cylinders) are corroding and need to be repaired. Corrosion is occurring underneath the ceramic coating which protects the operating

stems and provides a sealing surface for the cylinders' internal seals and the nickel plating on the eye ends has failed. Continued corrosion of the operating stems will cause the protective ceramic coating to flake off and the hydraulic cylinders will no longer be able to operate and retain hydraulic oil. There is a potential of losing 900 gallons (from one cylinder) of hydraulic oil into the tailrace (Lake of the Ozarks) downstream of the power plant. Cylinder drift and cycling has also become a problem due to leakage past the internal piston seals. The number of cycles per day depends on the individual cylinder and fluid temperature, but some of the cylinders are cycling over 300 times a day to keep the draft tube bulkheads from drifting into the water passageway. Repair of the cylinders and installation of an automatic latching (dogging) mechanism is needed to prevent the bulkheads from drifting into the water passageways.

Solution: The draft tube bulkhead cylinder work will include redesign of the ceramic protective coating system, repair/rebuilding of the hydraulic cylinders with the redesigned ceramic coating system, and design and installation of an automatic dogging mechanism to prevent cylinder drift. **The draft tube bulkheads will be removed from their slots and inspected and repaired in accordance with COE criteria in concurrence with the hydraulic cylinder repair contract to avoid a duplication of work effort.** The anodes on the bulkheads will also be replaced. Cavitation repair and painting of the draft tube liners and turbines will be performed after the draft tube bulkheads cylinders have been repaired and the draft tube bulkheads inspected/repared and certified for service.

Scope of Work: Perform engineering and design to develop a new protective coating system that protects the operating stems and an automatic latching dogging device that prevents cylinder drift. Prepare plans and specifications and advertise/award a contract to repair/rebuild the cylinders and install the dogging devices. COE (Kansas City District) will be responsible for the inspection and repair of the draft tube bulkheads. Work will include a visual inspection of all welds, documentation of inspection results, and repair of any weld and/or structural defects. Inspection and repair work will be performed by contract with COE oversight. Power Plant personnel will be responsible for purchasing and replacing the bulkheads' anodes. Also prepare plans and specifications for cavitation and corrosion repair work, sandblasting, and painting of draft tube liners, discharge rings, turbine runners, blades and wicket gates on all six units. Hired labor will be used to complete cavitation repair work and painting will be completed by contract.

Total Estimated Cost: \$6,105,000 over 7 years (FY 06 - \$1,390,000; FY07 - \$545,000; FY08 - \$1,005,000; FY09 - \$500,000; FY10 - \$1,165,000; FY11 - \$1,000,000; FY12 - \$500,000).

Costs/Impacts if Item is Not Funded:

- 1) Megawatts and Energy at Risk: Loss of 30 MW/unit of available generating capacity (180 MW total for six units).
- 2) Environmental: High risk of polluting (900 gal/cylinder) the Lake of the Ozarks.

3) Cost Savings: Avoid expensive repairs, environmental cleanup costs, and potential fines if repaired before a failure occurs. Major reduction in costs associated with future cavitation repair work.

4) Other: Unanticipated failure of bulkheads could lead to the loss of life and/or property damage. Reduces risk of extended unit outages.

Work / Funding Timeline:

<u>Activity Item</u>	<u>Time Frame</u>	<u>Dollars</u>
E&D, Protective Coating & Repair Alternatives	Feb – Aug 07	40,000
P&S, Cyl. Repair/Replacement	May 07 – Sep 08	30,000
Contract Admin. (Cyl. Repair)	Oct 08 – Nov 08	10,000
Cylinder Repair Contract	Dec 08 – Jul 11	3,060,000
S&A (Cyl. Repair)	Dec 08 – Jul 11	160,000
Bulkhead Inspection/Repair Work	Dec 08 – Jul 11	300,000
Anode Replacement	Dec 08 – Jul 11	30,000
P&S, Draft Tube/Turbine Painting	Jan – Jul 11	12,000
Contract Admin. (Paint Contract)	Aug - Oct 11	8,000
Cav. Repair/Blast & Paint 6 Units	Jan 11 – Sep 13	<u>2,455,000</u>
Total =		6,105,000

Duration with/without Customer Funding: Item has been submitted through the Corps’ normal budget cycle. Lack of available funding through COE channels appears to be getting worse. Customer funding would prevent failure of the bulkheads and/or hydraulic cylinders resulting in loss of life or property and extended unit outages. Funding of this item would also reduce the likelihood of a significant oil spill into the tailrace water downstream of the power plant resulting in environmental cleanup costs, potential violations and fines, and unit unavailability. Customer funding would also prevent extended outages for cavitation repair work, thereby increasing unit efficiency, availability and reliability. Without customer funding cavitation repair costs will continue to increase and unit efficiency will decrease.

Estimated Losses in Revenue/Benefits/Risk Factor: All units becoming unavailable as the bulkheads and/or hydraulic cylinders failed. Loss of available generation capacity for all six units is 180 MW (30 MW/unit). Loss of generation capability for an average year is 12.6 GWh. Estimated costs for recovering a failed cylinder is \$75,000/bulkhead cylinder. The costs for cleaning up an oil spill would also add to the overall costs of a failed cylinder. All units becoming in need of extensive cavitation repair work on the discharge rings, blades and liner. Annual cost savings for cavitation repair work is estimated at \$110,000. 30 MW of available generating capacity would be lost to perform cavitation repair on each unit.

$$30 \text{ MW/unit} \times 32 \text{ weeks} \times 5 \text{ days/week} \times 3 \text{ hours/day} \times \$67/\text{MWh} \approx \$965,000/\text{unit}$$

Summary of Funding Argument(s):

- Corps funding is not available.
- Prevent loss of control or failure of draft tube bulkhead cylinders.
- Possible loss of life and/or property if a bulkhead would fail.
- Loss of 30 MW/unit of available generating capacity (180 MW total for six units).
- Increased unit reliability and availability.
- Funding needed to reduce cavitation repair costs.
- Extended outage times required for extensive repair work.
- Increased spillway erosion due to the inability to generate.
- Dam Safety risk due to spillway erosion.
- High potential for environmental pollution.
- Extended unit outage times required for extensive repair work.

Photographs:



Information Data Sheet for Customer Funding

Hydropower Plant: All Little Rock Plants **Run of River** _____ **Storage** X
District: Little Rock
No. of Units: 27 **Capacity of Units (MW) (Overload)** 1,075
Estimated Average Annual Energy (MWH) (SWPA Annual Report) 2,867,000

Current Status of Project: All units in service.

Item Proposed for Customer Funding: Replace Little Rock District SCADA system hardware, update software, and centralize SCADA equipment.

Reason for Item:

<u> X </u> Reliability	_____ Environmental
_____ Efficiency	_____ Forced Outage
_____ Safety	<u> X </u> Preventative Maintenance
<u> X </u> Cost Savings	<u> X </u> Obsolete
_____ NERC Compliance	

History of Outages/Deficiency: Little Rock District has two SCADA systems. The SCADA system for Table Rock and Beaver power plants was purchased in 1991. The SCADA system for Bull Shoals, Norfolk, and Greens Ferry was replaced in 1995 and the system for Dardanelle and Ozark was replaced in 1997. The workstations and master station computers for the Table Rock system are obsolete and are no longer supported by the manufacturer. The spare parts supply is running low and new spare parts are becoming very difficult to obtain. Numerous failures of the main servers have occurred, and the systems installed at the other plants are nearing the end of their expected life.

Solution: Replace master station workstations, computers, and peripheral equipment and software. Hardware and software will be compatible with the new Centralized SCADA Control system. The replacement will start with the Table Rock and Beaver power plants system. The Bull Shoals and Dardanelle systems will be replaced over the next three years.

Scope of Work: Replace workstations, two master station computers, and peripherals. Purchase newest version of software. Work will be performed over several years by in-house personnel or by contract.

Total Estimated Cost: \$4,230,000 (FY06 - \$800,000; FY07 - \$474,000; FY08 - \$1,456,000; and FY09 - \$1,500,000)

Cost/Impacts if Item Not Funded:

- 1) Megawatts and Energy at Risk: 129MW
- 2) Environmental Risk: N/A
- 3) Cost Savings: N/A
- 4) Other: Loss of Automatic Generation Control

Work / Funding Timeline:

<u>Activity Item</u>	<u>Time frame</u>	<u>Dollars</u>
E&D	Jul 06 – Aug 07	755,000
Pre-Procurement	Aug 07 – Sep 07	80,000
Installation	Oct 07 – Sep 09	3,395,000

Duration with/without Customer Funding: Item has been submitted through the Corps' normal budget cycle. Lack of available funding through COE channels appears to be getting worse. Customer funding would prevent failure of the existing SCADA system, thereby increasing unit availability and reliability. Once work begins, replacement of a key component on the system will take 24 months.

Estimated Losses in Revenue/Benefits/Risk Factor:

Cost to Man Beaver Power Plant
(assuming spare parts can be found)
 $\$1,500/\text{day} \times 7 \text{ days/week} \times 2 \text{ weeks} \approx \$21,000/\text{occurrence}$

Cost to Man Plant and get upgrade from OEM
(assuming spare parts cannot be found)
 $\$1500/\text{day} \times 7 \text{ days/week} \times 4 \text{ weeks/month} \times 8 \text{ months} \approx \$360,000/\text{occurrence}$

Similar costs for outages would occur with the Bull Shoals and Dardanelle systems. There will be a cost savings of approximately \$750,000 per year after the centralization is completed because of the reduced number of powerplant operators that will be needed.

Summary of Funding Argument(s): Twelve to fifteen years is the normal life span of SCADA systems. This equipment is nearing its expected life. Piecemeal replacement of parts of the system is not possible because of technological advances. Periodic equipment upgrades is the most cost effective way to insure system reliability. Installation of the new SCADA system will support the centralization of powerplant control.

Photographs:



Information Data Sheet for Customer Funding

Hydropower Plant: DeGray Run of River ___ Storage X
District: Vicksburg
No. of Units: 2 Capacity of Units (MW) (Overload) 68 (78)
Estimated Average Annual Energy (MWH) (SWPA Annual Report) 97,000

Current Status of Project: 2 generators operational with the capability to run at 78.0 megawatts.

Item Proposed for Customer Funding: Rewind of Unit 1 and Unit 2.

Reason for Item:

<input checked="" type="checkbox"/> Reliability	<input type="checkbox"/> Environmental
<input checked="" type="checkbox"/> Efficiency	<input type="checkbox"/> Forced Outage
<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Preventative Maintenance
<input type="checkbox"/> Cost Savings	<input checked="" type="checkbox"/> Obsolete
<input type="checkbox"/> NERC Compliance	

History of Outages/Deficiency: The Generators are 34 years old. The Generator tests are showing degradation in the windings and one unit has had a coil removed and has Iron damage.

Solution: Rewind the Generator for Unit 1 and Unit 2.

Scope of Work: Rewind Generator for Unit 1 and rewind Generator for Unit 2.

Total Estimated Cost: \$9,500,000 (FY08 - \$4,500,000; FY09 - \$5,000,000)

Costs/Impacts if Item is Not Funded:

- 1) Megawatts and Energy at Risk: 40 MW
- 2) Environmental Risk: N/A
- 3) Cost Savings: N/A
- 4) Other: N/A

Work / Funding Timeline:

<u>Activity Item</u>	<u>Time frame</u>	<u>Dollars</u>
Rewind Unit 2	Sept 08 – May 09	\$4,500,000
Rewind Unit 1	Sept 09 – May 10	\$5,000,000

Duration with/without Customer Funding: The customers approved funding for the DeGray Generator Rewind plans and specifications in FY 2006 and which were developed by HDC in FY 2007. \$3,000,000 for the project has been included in the FY 2008 Budget. The FY 2009 Presidents Budget Request did NOT identify any funding for the rewind of Unit 1. Therefore, it is anticipated that customer funding will be needed to start and complete the necessary work on Unit 1. Customer funding for the Rewind of Unit 1 would prevent possible extended outages required for coil repairs and possible unit de-rating. Rewinding Units 1 and 2 will increase reliability, efficiency and output. Without customer funding, maintenance costs will continue to increase and unit reliability will decrease.

Estimated Losses in Revenue/Benefits/Risk Factor: In the case of a coil failure 40 MW of capacity could be lost. Estimated forced outage time would be about 52 weeks.

$$40 \text{ MW} \times 52 \text{ weeks} \times 5 \text{ days/week} \times 6 \text{ hours/day} \times \$67/\text{MWh} \approx \$4,181,000$$

Summary of Funding Argument(s):

- Corps funding is not available at this time.
- Increased reliability and availability.
- Timely repair with minimal interruption of service.
- Reduced likelihood of major failure.

Photographs:



Information Data Sheet for Customer Funding

Hydropower Plant: Webbers Falls **Run of River** X **Storage** _____
District: Tulsa
No. of Units: 3 **Capacity of Units (MW) (Overload)** 60 (69)
Estimated Average Annual Energy (MWH) (SWPA Annual Report) 213,000

Current Status of Project: 2 Units operational with the capability to run at 46 megawatts.

Item Proposed for Customer Funding: Generator Rewind of Unit 1, Unit 2 and Unit 3.

Reason for Item:

<input checked="" type="checkbox"/> Reliability	<input type="checkbox"/> Environmental
<input checked="" type="checkbox"/> Efficiency	<input type="checkbox"/> Forced Outage
<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Preventative Maintenance
<input type="checkbox"/> Cost Savings	<input checked="" type="checkbox"/> Obsolete
<input type="checkbox"/> NERC Compliance	

History of Outages/Deficiency: The generators are the original equipment installed when the powerhouse was built in 1973. One unit has experienced a coil failure which was repaired. The Webbers Falls Powerhouse Major Rehabilitation Report identified the generators as an equipment item that needed to be replaced. With the turbine rehabilitation at Webbers Falls, it is possible that a 6 MW uprate could be realized at the Webbers Falls powerplant.

Solution: Rewind the Generators for Unit 1, Unit 2 and Unit 3.

Scope of Work: Rewind the units.

Total Estimated Cost: \$6,000,000 (FY08 - \$2,000,000; FY09 - \$2,000,000; and FY10 – \$2,000,000)

Costs/Impacts if Item is Not Funded:

- 1) Megawatts and Energy at Risk: 23 MW
- 2) Environmental Risk: N/A
- 3) Cost Savings: N/A
- 4) Other: N/A

Work / Funding Timeline:

<u>Activity Item</u>	<u>Time frame</u>	<u>Dollars</u>
Rewind Unit 3	Sept 08 – May 09	\$2,000,000
Rewind Unit 1	Sept 09 – May 10	\$2,000,000
Rewind Unit 2	Sept 10 – May 11	\$2,000,000

Duration with/without Customer Funding: Without customer funding, the Units will continue to operate at the current rating (23 MW) and the obtainable uprate (2 MW per unit, 6 MW for the powerhouse) will not be realized. Delay in the rewind of the units will result in less power and energy that is available. The work item has been submitted through the Corps' normal budget cycle.

Estimated Losses in Revenue/Benefits/Risk Factor: If customer funding is not available, the generator rewind will be delayed until funds are available. Federal funds are not expected in the next 10 years.

$$6 \text{ MW} \times 520 \text{ weeks} \times 5 \text{ days/week} \times 8 \text{ hours/day} \times \$67/\text{MWh} \approx \$8,362,000$$

Summary of Funding Argument(s):

- Corps funding is not available at this time.
- Increased unit capacity
- Increased reliability and availability.
- Timely replacement with interruption of service timed with turbine rehabilitation outage.
- Reduced likelihood of major failure.

Photographs: None.

Information Data Sheet for Customer Funding

Hydropower Plant: Webbers Falls **Run of River** X **Storage** _____
District: Tulsa
No. of Units: 3 **Capacity of Units (MW) (Overload)** 60 (69)
Estimated Average Annual Energy (MWH) (SWPA Annual Report) 213,000

Current Status of Project: 2 Units operational with the capability to run at 46 megawatts.

Item Proposed for Customer Funding: Remaining Electrical and Mechanical work at the Webbers Falls Powerhouse to complete the powerhouse rehabilitation to increase reliability and to enable the uprate of the units.

Reason for Item:

- | | |
|---|--|
| <input checked="" type="checkbox"/> Reliability | <input type="checkbox"/> Environmental |
| <input checked="" type="checkbox"/> Efficiency | <input type="checkbox"/> Forced Outage |
| <input type="checkbox"/> Safety | <input checked="" type="checkbox"/> Preventative Maintenance |
| <input type="checkbox"/> Cost Savings | <input checked="" type="checkbox"/> Obsolete |
| <input type="checkbox"/> NERC Compliance | |

History of Outages/Deficiency: The Webbers Falls Powerhouse Major Rehabilitation Report identified the turbines and generators as the major equipment items that needed to be replaced. A benefit of replacing the generators is an anticipated 6 MW uprate. For the powerplant to operate with the increased capacity, the main power cables and generator main bus need to be uprated as well. Also, the maintenance elevator, air compressor, clearwell tank for the packing box water, trash racks, electrical distribution centers, HVAC system and powerplant emergency generator need replacement due to their existing condition. The maintenance elevator is unreliable and is required to efficiently and safely move personnel and equipment for maintenance and repair; the clearwell tank, which is used to store the clean water required by the packing boxes, has corroded and is leaking; the station and governor air compressors are existing equipment and are worn out; the trashracks have holes and no longer prevent large debris from entering the water passage; the electrical distribution centers have breakers that are not properly rated for the duty and the spare parts are difficult to obtain; the HVAC is obsolete and is unable to keep the controlled areas cooled; and the emergency generator is obsolete and not able to reliably supply the critical loads. All of these items need replacement to complete the major rehabilitation at Webbers Falls. In addition, it will be necessary to make electrical control, power, and relaying changes to incorporate the new equipment.

Solution: Repair / replace the main power cables, main bus, maintenance elevator, air compressors, clearwell tank for the packing box water, trash racks, electrical distribution centers, HVAC system and powerplant emergency generator.

Scope of Work: Perform the required electrical and mechanical work needed to replace the main power cables, main bus, maintenance elevator, air compressor, clearwell tank for the packing box water, trash racks, electrical distribution centers, HVAC system and powerplant emergency generator including electrical control, power and relaying changes required for the uprate and new equipment.

Total Estimated Cost: \$3,500,000

Costs/Impacts if Item is Not Funded:

- 1) Megawatts and Energy at Risk: 23 MW
- 2) Environmental Risk: N/A
- 3) Cost Savings: N/A
- 4) Other:N/A

Work / Funding Timeline:

<u>Activity Item</u>	<u>Time frame</u>	<u>Dollars</u>
Remaining Electrical and Mechanical Rehab Work	May 08 – May 11	\$3,500,000

Duration with/without Customer Funding: Without customer funding, the needed rehabilitation work will not be accomplished which may result in continued frequent forced outages and lost generation. The work item has been submitted through the Corps' normal budget cycle.

Estimated Losses in Revenue/Benefits/Risk Factor: If customer funding is not available, the remaining rehabilitation work will be delayed until funds are available. Federal funds are not expected in the next 3 years.

$$6 \text{ MW} \times 156 \text{ weeks} \times 5 \text{ days/week} \times 8 \text{ hours/day} \times \$67/\text{MWh} \approx \$2,508,000$$

Summary of Funding Argument(s):

- Corps funding is not available at this time.
- Increased reliability and availability.
- Timely repair with minimal interruption of service.
- Reduced likelihood of major failure.

Photographs: None.

Work / Funding Timeline:

<u>Activity Item</u>	<u>Time frame</u>	<u>Dollars</u>
E&D/P&S	Jan 09 – Apr 09	40,000
Procurement	May 09 – Aug 09	5,000
Contract	Sep 09 – May 10	355,000

Duration with/without Customer Funding: Customer funding would prevent possible extended outages due to transformer oil entering the waterway, thereby increasing unit reliability, efficiency and output.

Estimated Losses in Revenue/Benefits/Risk Factor: In case of a failure that cannot be controlled 50 MW of capacity could be lost. Estimated forced outage time would be about 30 weeks.

$$50 \text{ MW} \times 30 \text{ weeks} \times 5 \text{ days/week} \times 6 \text{ hours/day} \times \$67/\text{MWh} \approx \$3,015,000$$

Summary of Funding Argument(s):

- Reduced likelihood of an extended outage due to environmental remediation caused by a transformer failure.
- The TOCWG has reported that this project should be customer funded in FY 2009.

Photographs: None.

Information Data Sheet for Customer Funding

Hydropower Plant: Tenkiller Run of River___ Storage X
District: Tulsa
No. of Units: 2 Capacity of Units (MW) (Overload) 39 (45)
Estimated Average Annual Energy (MWH) (SWPA Annual Report) 95,000

Current Status of Project: 2 generators operational with the capability to run at 39 megawatts.

Item Proposed for Customer Funding: Transformer Oil Containment.

Reason for Item:

<input checked="" type="checkbox"/> Reliability	<input checked="" type="checkbox"/> Environmental
<input type="checkbox"/> Efficiency	<input checked="" type="checkbox"/> Forced Outage
<input type="checkbox"/> Safety	<input type="checkbox"/> Preventative Maintenance
<input type="checkbox"/> Cost Savings	<input type="checkbox"/> Obsolete
<input type="checkbox"/> NERC Compliance	

History of Outages/Deficiency: The transformers are 54 years old and oil containment will reduce the risk to the downstream water. If a transformer fails and oil is released into the tailrace, the environmental cleanup would impact the plant availability until cleanup has been completed. This project was identified to be funded in FY 2009 by the Transformer Oil Containment Work Group (TOCWG).

Solution: Construct oil containment.

Scope of Work: Produce plans and specifications for oil containment.

Total Estimated Cost: \$400,000

Costs/Impacts if Item is Not Funded:

- 1) Megawatts and Energy at Risk: 19 MW
- 2) Environmental Risk: Potential of an oil release.
- 3) Cost Savings: N/A
- 4) Other: N/A

Work / Funding Timeline:

<u>Activity Item</u>	<u>Time frame</u>	<u>Dollars</u>
E&D/P&S	Jan 09 – Apr 09	40,000
Procurement	May 09 – Aug 09	5,000
Contract	Sep 09 – May 10	355,000

Duration with/without Customer Funding: Customer funding would prevent possible extended outages due to transformer oil entering the waterway, thereby increasing unit reliability, efficiency and output.

Estimated Losses in Revenue/Benefits/Risk Factor: In case of a failure that cannot be controlled 19.5 MW of capacity could be lost. Estimated forced outage time would be about 30 weeks.

$$19.5 \text{ MW} \times 30 \text{ weeks} \times 5 \text{ days/week} \times 6 \text{ hours/day} \times \$67/\text{MWh} \approx \$1,176,000$$

Summary of Funding Argument(s):

- Reduced likelihood of an extended outage due to environmental remediation caused by a transformer failure.
- The TOCWG has reported that this project should be customer funded in FY 2009.

Photographs: None.

Funding Year 2009

Information Data Sheet for Customer Funding

Hydropower Plant: RS Kerr

Run of River X **Storage** ___

District: Tulsa

No. of Units: 4

Capacity of Units (MW) (Overload) 110 (126.5)

Estimated Average Annual Energy (MWh)

(SWPA Annual Report) 459,000

Current Status of Project: All units are currently available for service.

Item Proposed for Customer Funding: Sand blast and paint intake and draft tube gates, replace seals, bolts, replace chains, cables and replace cathodic protection anodes.

Reason for Item:

X Reliability

___ Environmental

___ Efficiency

___ Forced Outage

___ Safety

X Preventative Maintenance

___ Cost Savings

___ Obsolete

___ NERC Compliance

History of Outages/Deficiency: The intake and draft tube gate paint system is failing due to age which is leading to structural deterioration of the gates. The existing paint on the gates is vinyl. The roller chains have pitted rollers and several of the keepers on the pins have failed. In recent years, several rollers have cracked and were replaced. Many of the fasteners have deteriorated and the seals on the gates are in poor condition and must be replaced as part of the project. Numerous areas on the surface of the gates are corroding where the paint system has failed. Deterioration will continue until the gates are repaired. Each of the four intake roller gates are approximately 21'-wide by 40 ft in length, each of the six bulkheads are 20' by 43' and each of six the draft tube gates are 20' wide by 31' in length.

Solution: Sand blast the intake and draft tube gates, make any required structural repairs, repaint with an acceptable paint system, repair or replace all roller chains where required, and replace all seals and bolts on all of the gates.

Scope of Work: Prepare plans and specifications to rehabilitate the intake and draft tube gates.

Total Estimated Cost: \$1,600,000

Costs/Impacts if Item is Not Funded:

- 1) Megawatts and Energy at Risk: 27.5 MW, 1650 MWh
- 2) Environmental Risk: None
- 3) Cost Savings: \$2,000/year of O&M Cost
- 4) Other: N/A

Work / Funding Timeline:

<u>Activity Item</u>	<u>Time frame</u>	<u>Dollars</u>
E&D/P&S	Jan 09 – Apr 09	40,000
Procurement	May 09 – Aug 09	5,000
Contract	Sep 09 – May 10	1,555,000

Duration with/without Customer Funding: Without customer funding, the intake and draft tube gates will continue to deteriorate. Continued deterioration will result in the failure of structural components of the gates and increasing costs and time of repair until gates are no longer useable. An increased chance of roller chain failure in an emergency condition will also exist. These gates are used for emergency closure of the water intake to the turbines, and the generators can not be operated without operational intake gates. With customer funding, the gates can be repaired and the probability of gate failing to close or open when needed is greatly reduced.

Estimated Losses in Revenue/Benefits/Risk Factor: \$2,000/yr average savings in O&M costs. Intake gate failure could result in:

$$27.5 \text{ MW} \times 4 \text{ weeks} \times 5 \text{ days/week} \times 6 \text{ hours/day} \times \$67/\text{MWh} \approx \$221,000$$

Summary of Funding Argument(s):

- Due to the condition and age of the gates and roller chains and their deteriorated condition, the availability of the gates for operation may be impacted if the gates are not repaired. Corrosion of structural members could effect the ability to use the gates
- Delay in rehab and painting will result in increased repair costs to replace corroded structural members.

Photographs:



Draft Tube Gate



Draft Tube Gate



Intake Gate



Intake Gate



Intake Gate

Information Data Sheet for Customer Funding

Hydropower Plant: Fort Gibson **Run of River** X **Storage**
District: Tulsa
No. of Units: 4 **Capacity of Units (MW) (Overload)** 45 (52)
Estimated Average Annual Energy (MWh) (SWPA Annual Report) 191,000

Current Status of Project: All units are currently available for service.

Item Proposed for Customer Funding: Replace the un-watering pumps, house sump pumps, piping and valves.

Reason for Item:

<u> X </u> Reliability	<u> </u> Environmental
<u> </u> Efficiency	<u> </u> Forced Outage
<u> </u> Safety	<u> X </u> Preventative Maintenance
<u> </u> Cost Savings	<u> X </u> Obsolete
<u> </u> NERC Compliance	

History of Outages/Deficiency: The two un-watering pumps, two house sump pumps, piping and valves were installed approximately 50 years ago as original powerhouse equipment and have corroded and deteriorated. Recent failures have required repairs to the system to keep it operational. The pumps leak due to deteriorated metal and seals.

Solution: Replace the existing un-watering pumps, house sump pumps, piping and valves.

Scope of Work: Prepare the necessary specifications, drawings, and work description, and contract for the replacement of the un-watering pumps, sump pumps, piping and valves.

Total Estimated Cost: \$300,000

Costs/Impacts if Item is Not Funded:

- 1) Megawatts and Energy at Risk: 11 MW
- 2) Environmental Risk: None
- 3) Cost Savings: None
- 4) Other: N/A

Work / Funding Timeline:

<u>Activity Item</u>	<u>Time frame</u>	<u>Dollars</u>
E&D/P&S	Jan 09 – Mar 09	10,000
Procurement	Apr 09 – Jun 09	5,000
Contract	Jul 09 – Jan 10	285,000

Duration with/without Customer Funding: Without Customer funding, the existing sump pumps, piping and valves will continue to deteriorate until they fail or require additional maintenance to keep operational.

Estimated Losses in Revenue/Benefits/Risk Factor: Possible loss in availability of dewatering hydropower units for routine maintenance. Possibility of flooding powerhouse.

$$11.25 \text{ MW} \times 4 \text{ weeks} \times 5 \text{ days/week} \times 6 \text{ hrs/day} \times \$67/\text{Mwh} \approx \$90,000$$

Summary of Funding Argument(s): The system is required to un-water the units to gain access to the turbine during maintenance. The equipment is deteriorated beyond its useful life. Recent failures have had to be repaired to keep system in service.

Photographs:



Information Data Sheet for Customer Funding

Hydropower Plant: Norfolk Run of River Storage X
District: Little Rock
No. of Units: 2 Capacity of Units (MW): 80
Estimated Average Annual Energy (MWh) (SWPA Annual Report): 184,000

Current Status of Project: The project has all units available for operation. The generators were placed in service in 1944 and 1950.

Item Proposed for Customer Funding: Rehabilitate station sump system and associated piping.

Reason for Item:

<input checked="" type="checkbox"/> Reliability	<input type="checkbox"/> Environmental
<input type="checkbox"/> Efficiency	<input type="checkbox"/> Forced Outage
<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Preventative Maintenance
<input type="checkbox"/> Cost Savings	<input checked="" type="checkbox"/> Obsolete
<input type="checkbox"/> NERC Compliance	

History of Outages/Deficiency: Existing equipment is 63 years old and beyond its normal life expectancy and in need of replacement. There are leaks and the piping is corroded. The piping is very thin and weak. Numerous patches have been installed to stop leaks.

Solution: Rehabilitate station sump, controls, structural support members, pumps, and associated piping.

Scope of Work: Prepare the necessary equipment specifications, drawings and description of work and contract for the purchase and installation of the new equipment.

Total Estimated Cost: \$500,000

Cost/Impacts if Item Not Funded:

- 1) Megawatts and Energy at Risk: 40 MW, 2400 MWh
- 2) Environmental Risk: None
- 3) Cost Savings: None
- 4) Other: None.

Work/Funding Timeline:

<u>Activity Item</u>	<u>Time frame</u>	<u>Dollars</u>
E&D/P&S	Jan 09 – Apr 09	40,000
Procurement	Apr 09 – Jun 09	15,000
Contract	Jul 09 – Jan 10	445,000

Duration with/without Customer Funding: O&M funding not available for the foreseeable future.

Estimated Losses in Revenue/Benefits/Risk Factor: If the station sump were to fail then flooding of the power plant could occur (depending on if the failure occurred when the plant was unmanned). This would result in significant costs to repair. An outage of the entire plant for approximately two weeks could occur.

$$40 \text{ MW} \times 2 \text{ weeks} \times 5 \text{ days/week} \times 6 \text{ hours/day} \times \$67/\text{MWh} \approx \$161,000$$

Summary of Funding Argument(s):

- Corps funding is not available at this time
- Increased reliability
- Timely repair with minimal interruption of service
- Repair will reduced likelihood of major failure

Photographs:



Sump Pump Piping



Sump Pump Piping

Costs/Impacts if Item is Not Funded:

- 1.) Megawatts and Energy at Risk: 27 MW, 3240 MWh
- 2.) Environmental Risk: None
- 3.) Cost Savings: Possible large-scale cost for repairs if failure occurs; Failure of circuit breaker can lead to extended outage; No reliability of 480V system.
- 4.) Other: None

Work / Funding Timeline:

<u>Activity Item</u>	<u>Time frame</u>	<u>Dollars</u>
Plans & Specs	Jan 09 – Mar 09	5,000
Procurement	Apr 09 – Jun 09	2,000
Contract	Aug 09 – Aug 13	178,000

Duration with/without Customer Funding: Funding is not available through the U.S. Army Corps of Engineers. The large number of unfunded maintenance work items grows each year. Only “high priority” items receive funding through budget and ranking process. Funding through normal appropriations is not expected in the next three years.

Estimated Losses in Revenue/Benefits/Risk Factor: The circuit breakers are ageing and are no longer manufactured making the risk of a forced outage greater; therefore, reducing the power system reliability. Minimal loss of service would be two months:

$$27 \text{ MW} \times 8 \text{ weeks} \times 5 \text{ days/week} \times 3 \text{ hours/day} \times \$67/\text{MWh} \approx \$217,000$$

Summary of Funding Argument(s):

- Restored equipment reliability of 480V system.
- Significant cost savings vs. buying new equipment.
- Decrease the number of unplanned prolonged facility outage while increasing personnel safety.
- Timely replacement of critical generating component.

Photographs:



Information Data Sheet for Customer Funding

Hydropower Plant: Denison **Run of River** **Storage**
District: Tulsa
No. of Units: 2 **Capacity of Units (MW) (Overload)** 70 (88)
Estimated Average Annual Energy (MWh) (SWPA Annual Report) 219,000

Current Status of Project: All units are currently available for service.

Item Proposed for Customer Funding: Sand blast, repair, and repaint draft tube gates.

Reason for Item:

<input checked="" type="checkbox"/> Reliability	<input type="checkbox"/> Environmental
<input type="checkbox"/> Efficiency	<input type="checkbox"/> Forced Outage
<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Preventative Maintenance
<input type="checkbox"/> Cost Savings	<input type="checkbox"/> Obsolete
<input type="checkbox"/> NERC Compliance	

History of Outages/Deficiency: The draft tube gate paint system is failing due to age which is leading to structural deterioration of the gates. The existing paint on the gates is vinyl. Some of the fasteners on the gates have deteriorated and the seals on the gates are in poor condition and must be replaced as part of the project. Numerous areas on the surface of the gates are corroding where the paint system has failed. Deterioration will continue until the gates are repaired resulting in increased cost of repair and structural damage to the point where the gates will no longer be allowed to be used. The draft tube gates are required to un-water the unit for maintenance. The four draft tube gates are approximately 23 feet wide by 9 feet high.

Solution: Sand blast draft tube gates, make any required structural repairs, repaint with an acceptable paint system, and replace seals and bolts on the gates.

Scope of Work: Prepare plans and specifications and rehabilitate draft tube gates and paint the intake gate hoists.

Total Estimated Cost: \$400,000

Costs/Impacts if Item is Not Funded:

- 1) Megawatts and Energy at Risk: 35 MW, 2100 MWh
- 2) Environmental Risk: none
- 3) Cost Savings: \$2,000/year of O&M Cost
- 4) Other: N/A

Work / Funding Timeline:

<u>Activity Item</u>	<u>Time frame</u>	<u>Dollars</u>
E&D/P&S	Jan 09 – May 09	15,000
Procurement	Jun 09 - Aug 09	10,000
Contract	Sept 09 - May 10	375,000

Duration with/without Customer Funding: Without customer funding, the draft tube gates will continue to deteriorate to a point where structural components of gates will become affected which will increase cost and increase time of eventual repair outage. Also, the deterioration is allowed to progress the gates may be allowed to be used because the structural integrity to protect personnel. With customer funding, the gates and cases can be repaired and the probability of failures is greatly reduced.

Estimated Losses in Revenue/Benefits/Risk Factor: \$2,000/yr average savings in O&M costs.

$$35 \text{ MW} \times 3 \text{ weeks} \times 5 \text{ days/week} \times 4 \text{ hours/day} \times \$67/\text{MWh} \approx \$141,000$$

Summary of Funding Argument(s):

- Due to the condition and age of the gates and cases and their deteriorated condition, the availability of the equipment for operation may be impacted if the gates are not repaired.
- Delay in maintenance painting will possibly result in the need to replace structural members and lead to increased repair costs.

Photographs:



Draft Tube Gate



Draft Tube Gate

Information Data Sheet for Customer Funding

Hydropower Plant: Greers Ferry Run of River Storage X
District: Little Rock
No. of Units: 2 Capacity of Units (MW): 96
Estimated Average Annual Energy (MWh) (SWPA Annual Report): 189,000

Current Status of Project: Both units currently available for service.

Item Proposed for Customer Funding: Replace the existing generator air coolers and associated piping.

Reason for Item:

<input checked="" type="checkbox"/> Reliability	<input type="checkbox"/> Environmental
<input type="checkbox"/> Efficiency	<input type="checkbox"/> Forced Outage
<input type="checkbox"/> Safety	<input checked="" type="checkbox"/> Preventative Maintenance
<input type="checkbox"/> Cost Savings	<input type="checkbox"/> Obsolete
<input type="checkbox"/> NERC Compliance	

History of Outages/Deficiency: Due to corrosion, the generator air coolers and associated water piping system is beginning to develop leaks that must be repaired immediately to prevent water from spraying onto the generator stator. The leaking coolers must be removed for repairs, and experience has shown that once failures begin the frequency and severity of the leaks increases.

Solution: Replace Air Coolers. New coolers will be purchased with a supply contract and installed by in house staff.

Scope of Work: Prepare the necessary specifications, drawings, and description of work and contract for the purchase and installation of the new components.

Total Estimated Cost: \$550,000

Cost/Impacts if Item Not Funded:

- 1) Megawatts and Energy at Risk: 48 MW, 11,520 MWh
- 2) Environmental Risk: None
- 3) Cost Savings: None
- 4) Other: None

Work / Funding Timeline:

<u>Activity Item</u>	<u>Time frame</u>	<u>Dollars</u>
Plans & Specs	Jan 09 – Apr 09	40,000
Procurement	Apr 09 – Aug 09	10,000
Installation	Aug 09 – Aug 10	500,000

Duration with/without Customer Funding: O&M funding not available for the foreseeable future.

Estimated Losses in Revenue/Benefits/Risk Factor: In case of a failure that cannot be fixed 48 MW of capacity would be lost. Estimated forced outage time would be two months.

$$48 \text{ MW} \times 8 \text{ weeks} \times 5 \text{ days/week} \times 6 \text{ hours/day} \times \$67/\text{MWh} \approx \$772,000$$

Summary of Funding Argument(s):

- Corps funding is not available at this time
- Reduced likelihood of major failure

Photographs:



Work / Funding Timeline:

<u>Activity Item</u>	<u>Time frame</u>	<u>Dollars</u>
E&D/P&S	Oct 08 - Dec 08	30,000
Procurement	Jan 09- Mar 09	5,000
Contract	Mar 09 – Jan 10	310,000
Update fault study	July 09 – Jan 10	5,000

Duration with/without Customer Funding: Without customer funding, the breakers will remain in service, but with increased inspection and maintenance until funding is available. Federal funds are not anticipated for the next 3 years.

Estimated Losses in Revenue/Benefits/Risk Factor: Possible loss in availability of 27.5 MW for one month:

$$27.5 \text{ MW} \times 4 \text{ weeks} \times 5 \text{ days/week} \times 6 \text{ hrs/day} \times \$67/\text{Mwh} \approx \$221,000$$

Summary of Funding Argument(s):

- Major damage to the generating units is possible if breakers fail to operate timely in response to sudden failure.
- An extended outage of one month is possible to repair or replace damage equipment.
- Reduced circuit breaker maintenance required for new vacuum bottle circuit breakers. Existing breakers continue to be problematic because of atmospheric moisture contamination of the arc chutes.
- Existing station service breakers are marginally rated for the existing duty.

Photographs:



Breaker Element

Information Data Sheet for Customer Funding

Hydropower Plant: Bull Shoals Run of River Storage X
District: Little Rock
No. of Units: 8 Capacity of Units (MW): 340
Estimated Average Annual Energy (MWh) (SWPA Annual Report): 785,000

Current Status of Project: The project has all units available for operation. The generators were placed in service in 1952, 1953, 1962, and 1963.

Item Proposed for Customer Funding: Replace station service batteries and provide seismic supports.

Reason for Item:

<input checked="" type="checkbox"/> Reliability	<input type="checkbox"/> Environmental
<input type="checkbox"/> Efficiency	<input type="checkbox"/> Forced Outage
<input type="checkbox"/> Safety	<input type="checkbox"/> Preventative Maintenance
<input type="checkbox"/> Cost Savings	<input checked="" type="checkbox"/> Obsolete
<input type="checkbox"/> NERC Compliance	

History of Outages/Deficiency Batteries are cracking and leaking and in need of replacement. Seismic racks are also needed. The batteries supply station controls. Loss of battery bank would result in loss of all unit controls.

Solution: Purchase new batteries and racks and install by Corps personnel.

Scope of Work: Prepare the necessary equipment specifications, drawings and description of work, and contract for the purchase and installation of new components.

Total Estimated Cost: \$75,000

Cost/Impacts if Item Not Funded:

- 1) Megawatts and Energy at Risk: 340MW, 2,720 MWh
- 2) Environmental Risk: None
- 3) Cost Savings: None
- 4) Other: N/A.

Work / Funding Timeline:

<u>Activity Item</u>	<u>Time frame</u>	<u>Dollars</u>
Procurement	June 09	3,000
Installation	Sep 09 – Dec 09	72,000

Duration with/without Customer Funding: O&M funds not available for the foreseeable future.

Estimated Losses in Revenue/Benefits/Risk Factor: In case of a failure that cannot be immediately repaired 340 MW of capacity would be lost. Estimated forced outage time would be eight hours before replacement parts can be obtained and the breaker fixed.

$$340 \text{ MW} \times 8 \text{ hours/day} \times \$67/\text{MWh} \approx \$182,000$$

Summary of Funding Argument(s):

- Corps funding is not available at this time
- Increased reliability

Photographs: None.