WHITNEY POWERHOUSE MAJOR REHABILITATION

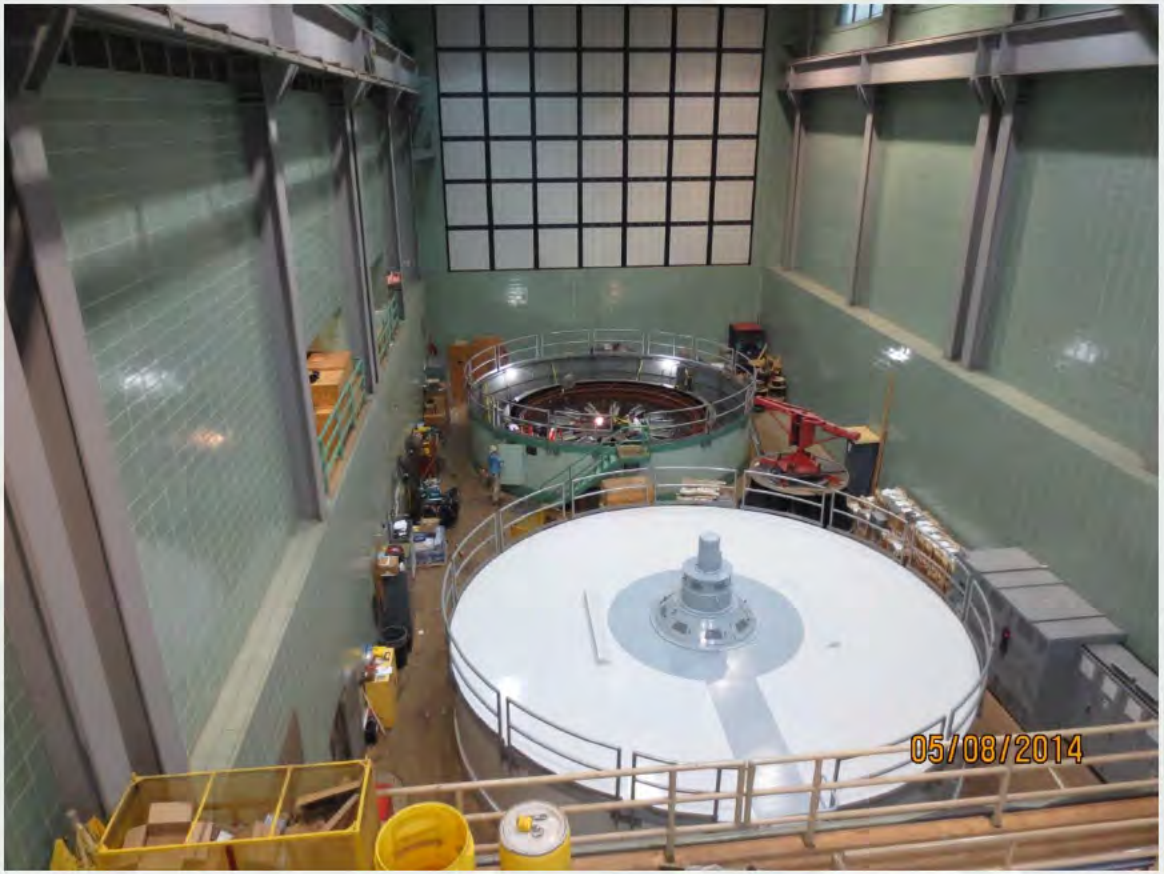
[redacted]

17 June 2015

US Army Corps of Engineers
BUILDING STRONG®

Whitney Powerhouse

Whitney Power Plant Main Generating Units Rehab Project



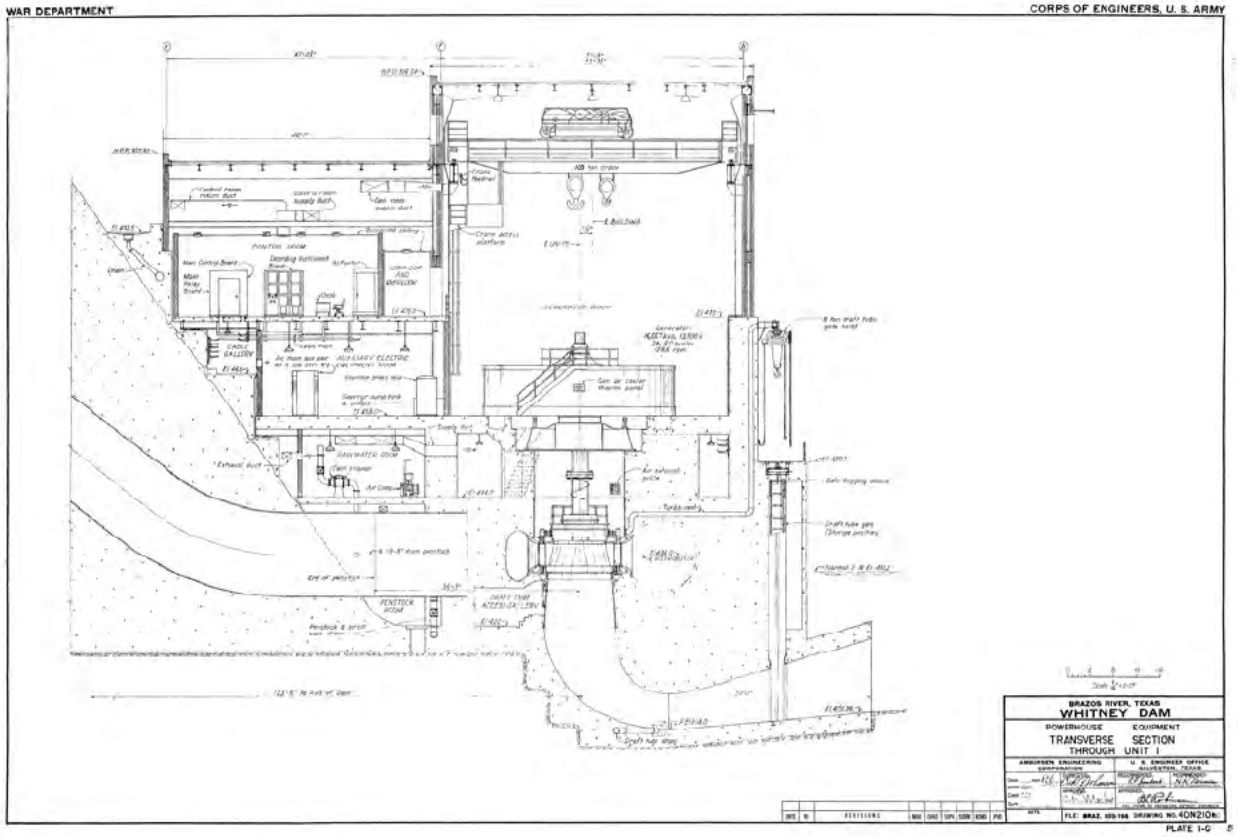
General Plant Information

Whitney Powerhouse

- 30 MW capacity, Peaking Plant
- Purpose – Flood Control, Hydropower, Recreation
- Two vertical axis Francis units
- Average annual energy produced - 73,000 MWH
- Plant placed in service in 1953
- Remote operated from Sam Rayburn Plant
- Located on the Brazos River near Whitney, TX

Cross Section View

Whitney Powerhouse



Project Development
Whitney Powerhouse

- Major Rehabilitation Evaluation Report approved in July 2001.
- Report approved Option C which replaced the turbine runners, rewound the generators with a proposed increase of 6 MW each, and replaced governors, exciters, and breakers.

Rehab History

Whitney Powerhouse

- Replaced three single phase transformers with one three phase transformer, June 2001.
- Switchyard Renovation, including new SF6 breakers, new busswork, potheads, CTs, PTs, and control cabling, November 2002.
- Main switchgear and power cable replacement, December 2004.
- Draft tube gate rehab and draft tube gate hoist replacement, March 2005.
- Protective relays and high impedance grounding, April 2005.
- Bridge crane repairs and upgrades, June 2007

Rehabilitation Project

- Unit Rated to 23.3 MW increased from 15MW
- New Digital Governors
- New Francis Turbines
- New Rotor Poles
- New Stator – Built on existing frame
- New Exciters
- New Wicket Gates
- New Cooling Water System-Piping, Strainers, Valves, Air and Oil Coolers

Rehabilitation Project

- New Head Cover Studs and Nuts
- New Paint on all components
- New Generator Thrust Bearings
- New Generator Guide Bearings
- New Turbine Bearings
- New Unit Lube Oil Piping and Pumps
- New Synchronizers
- Head Cover, Servo Motors, Servo Rings, and Wicket Gate Linkages reconditioned

Turbine/Generator Contract
Time Line

- Base Period of Contract Awarded July 2007
- Option Period #1 Awarded April 2008
- Option Period #2 Awarded September 2009
- Option Period #3 Awarded July 2010
- Option Period #4 Awarded July 2011
- Original Contract Completion was Scheduled for July 2012

Turbine/Generator Contract

Contract Work Breakout

- Base Period included E&D for all work
- Option Period #1 included procurement of turbines and all generator rewind components
- Option Period #2 included site mobilization, disassembly, and repairs to Unit #1
- Option Period #3 included reassembly of Unit #1 and disassembly and repairs to Unit #2
- Option Period #4 included reassembly of Unit #2 and site demobilization.

Turbine/Generator Contract

Cost Breakout

- Base Period (Appropriations) $3.3M
- Option Period #1 (Appropriations) $4.3M
- Option Period #2 (Customer Funding) $4.4M
- Option Period #3 (Customer Funding) $4.6M
- Option Period #4 (Customer Funding) $3.6M
- Optional Items (Appropriations) $1.0M
- Optional Items (Customer Funding) $1.1M
- Total Contract Bid Price $22.3M

Turbine/Generator Contract

Modifications

- 28 Modifications required to original contract
- Most modifications were required for repairs to components not covered in original contract
- Modifications for additional work have increased the contract price by $3,600,000

Whitney Rehab Sub-Agreement Funding

	Option #2	Option #3	Option #4	Supplemental Funding
Contract & Modifications	$5,230,000	$5,150,000	$4,255,000	$1,170,000
Contingencies	$576,000	$595,000	$505,000	$380,000
S&A/EDC	$530,000	$800,000	$800,000	$950,000
Sub Total	$6,336,000	$6,545,000	$5,560,000	$2,500,000

Major Rehabilitation
Whitney Powerhouse

Removal of rotor for Unit # 1

Major Rehabilitation
Whitney Powerhouse

Old Turbine Runner and
Turbine Shaft

Stator, Turbine and turbine Shaft, Head Cover

Head Cover and Wicket Gate Linkage

Installation of Thrust Bridge

Generator Rotor Installation

Turbine Pit Completed

Turbine/Generator Contract

Unit #1 Status

- Successfully commissioned in March 2014
- Commenced commercial operations in April 2014
- Currently generating 24/7 with release of flood waters

Turbine/Generator Contract

Unit #2 Status

- April 2014 rehab started on Unit 2
- Remaining work: Finish assembly, Conduct systems checks, Startup & Commissioning
- Commissioning scheduled to start 29 June 2015

Questions