Channelview Cogeneration

Winter Weatherization Review

EIF Channelview Cogeneration, LLC

Presented by Conyers Horton & Mike Moyer

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Presentation Overview

- Description of the Facility
- Results from the 2015 ERCOT Winter Weatherization Spot Check
- Areas of Improvement
- Plant Winter Weatherization Procedure

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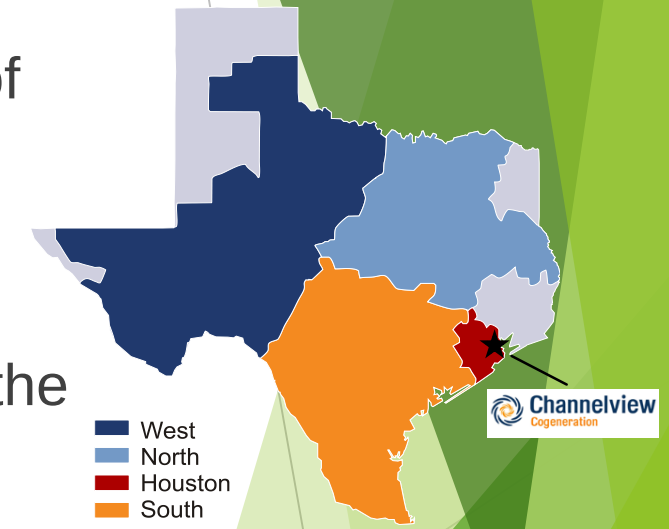
- Located in Channelview, TX
- The site is a Combined-Cycle Cogeneration plant consisting of four Siemens 501FD2 Combustion Turbine/ Nooter-Eriksen HRSG trains that feed an Alstom Steam Turbine Generator
- Total plant output is 830 MW's
- The site is electrically interconnected to the Houston Zone of the ERCOT Wholesale Electric Market via 345kV and 138kV connections.
- The plant is a QF facility to a neighboring chemical plant meeting their steam and electrical requirements



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- Commercial Operation Date
  - Unit 4 – August 2001
  - Units 1,2,3,5 – June 2002
- Plant Construction
  - HB Zachary
  - Construction began end of 1999

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Results from the 2015 ERCOT Winter Weatherization Spot Check

- Wrong type of Tarps & Blankets
- Heat Trace panel screens were unreadable
- Heat Trace not functioning properly (open circuits)
- Exposed Heat Trace cables (uninsulated)
- Gaps in insulation
- Plant Procedure needed work

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Plant Winter Weatherization Procedure

- The Winter Weather Procedure OP 11.00 covers:
- Freeze Alert Level One – which starts when the temperature drops below 45 degrees F and the forecast indicates the temperature will remain below 32 degrees F for 2 to 3 hours but will rise significantly above 32 degrees F the following day.
- Freeze Alert Level Two – which starts when the temperature is below 28 degrees F for 4 to 12 hours.
- Annual Training

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Annual Training

- Review the Plant Procedure (OP 11.00)
- Discuss what to look for during Plant rounds
- Review Checklists
- Review past winter incidents
- Documented with a sign off sheet

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Plant Winter Weather Procedure

- Responsibilities
  - The Operations Manager and the Maintenance Manager are responsible for designating personnel for freeze protection duty
  - It is the responsibility of all personnel to exercise good judgement in the performance of this procedure
  - Channelview Operations and the Steam Host will communicate with each other when unusual conditions exist that may affect the operation of either facility

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Attachments to the Winter Weatherization Procedure (OP 11.00)

- Heat Trace Circuit Inspection Sheet
- Critical Instrument List
- Cold Weather Preparedness List
- Winter Weather Insulation List
- Main Power Transformer Oil Level Record Sheet
- Cabinet Temperature Round Sheet

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Attachment 1 – Heat Trace Circuit Inspection Sheet

CKT. #	DWG. #	FP #	PANEL #	AMPS	COMMENTS
M1C01	WILRE355	1FP013	U1H1-P1	5.5	
M1C01	WILRE377	NOT USED			
M1C01	WILRE390	1FP041	U1H1-P1	0.6	
M1C01	WILRE396	1FP068	U1H1-P1	0.6	
M1C03	WILRE352	1FP004	U1H1-P1	2.4	
M1C03	WILRE355	1FP007	U1H1-P1	1.5	
M1C03	WILRE385	1FP054	U1H1-P1	4.4	
M1C03	WILRE390	1FP061	U1H1-P1	2.2	
M1C03	WILRE414	1FP117	U1H1-P1	1.7	
M1C04	WILRE433	1FP019	U1H1-P1	3.5	

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Attachment 2 – Critical Instrument List

sl_tag_number	description	primary_drawing_number	Insulated	Heat Traced	Wind Break
0FT-CD202	COND PMP DSCH HDR FLOW	M-104-1	X	X	
0FT-LW203A	LP STM TO EQ FLOW A	M-102-2	X	X	
0FT-LW203B	LP STM TO EQ FLOW B	M-102-2	X	X	
0FT-MS207A	HP STM TO EQ FLOW A	M-102-1	X	X	
0FT-MS207B	HP STM TO EQ FLOW B	M-102-1	X	X	
0FT-MU211A	LPFP A DISCH FLOW	M-107-1	X	X	
0FT-MU211B	LPFP B DISCH FLOW	M-107-1	X	X	
0FT-MU211C	LPFP C DISCH FLOW		X	X	
0LT-CD211A	CNSR HW LVL A	M-104-1	X	X	
0LT-CD211B	CNSR HW LVL B	M-104-1	X	X	
0LT-CD211C	CNSR HW LVL C	M-104-1	X	X	
0LT-MU204A	COND STOR TK LVL A	M-107-1	X	X	
0LT-MU204B	COND STOR TK LVL B	M-107-1	X	X	
0LT-MU204C	COND STOR TK LVL C	M-107-1	X	X	
0LT-MU209A	COND RTRN TK LVL A	M-107-1	X	X	
0LT-MU209B	COND RTRN TK LVL B	M-107-1	X	X	
0LT-MU209C	COND RTRN TK LVL C	M-107-1	X	X	
0PIT-WC201A	AUX WTR PMP A DSCH PRESS	M-105-1	X	X	
0PIT-WC201B	AUX WTR PMP B DSCH PRESS	M-105-1	X	X	
0PT-AD201A	AD STM PRESS A	M-102-2	X	X	
0PT-AD201B	AD STM PRESS B	M-102-2	X	X	

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Cold Weather Preparedness List

- Tarps
- Portable Heaters & Heat Lamps
- Propane
- Temporary Insulation
- Portable Lighting
- Instrumentation Tubing
- Temporary Heat Trace
- Extension Cords
- Hand Warmers

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Attachment 3 – Cold Weather Preparedness List

	Units	Qty Required	Qty On Hand	Inventoried By:
Tarps	Each	20		
Portable heaters				
480VAC	Each	2		
110VAC	Each	3		
Propane	Each	3		
Heat lamps	Each	18		
Drop Lights	Each	12		
Extension cords				
480VAC	Each	4		
110VAC	Each	18		
Propane				
Cylinders	Each	6		
Bottles	Each	20		
Temporary insulation	Boxes	2		
Plastic rolls	Each	1		
Portable lighting	Each	10		
Instrumentation tubing				
1/4"	Feet	90		
3/8"		60		
1/2"	Feet	60		
Handheld welding torches	Each	6		
Diesel	Barrels	4		
Temporary Heat Trace	Each	8		
Ear protection	Each	30		
Hand Warmers	Each	50		

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Attachment 4 – Winter Weather Insulation List

Insulation Satisfactory (Y/N	sl_tag_number	description	drawing_number
	0FT-CD202	COND PMP DSCH HDR FLOW	M-104-1
	0FT-LW203A	LP STM TO EQ FLOW A	M-102-2
	0FT-LW203B	LP STM TO EQ FLOW B	M-102-2
	0FT-MS207A	HP STM TO EQ FLOW A	M-102-1
	0FT-MS207B	HP STM TO EQ FLOW B	M-102-1
	0FT-MU211A	LPFP A DISCH FLOW	M-107-1
	0FT-MU211B	LPFP B DISCH FLOW	M-107-1
	0FT-MU211C	LPFP C DISCH FLOW	
	0LT-CD211A	CNSR HW LVL A	M-104-1
	0LT-CD211B	CNSR HW LVL B	M-104-1
	0LT-CD211C	CNSR HW LVL C	M-104-1
	0LT-MU204A	COND STOR TK LVL A	M-107-1
	0LT-MU204B	COND STOR TK LVL B	M-107-1
	0LT-MU204C	COND STOR TK LVL C	M-107-1

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Attachment 5 – Main Power Transformer Oil Level Record Sheet

Transformer	Oil Temperature	Oil Level	Level Satisfactory (Y/N)
MPT 1			
MPT 2			
MPT 3			
MPT 4			

Inspector:	
Date:	

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Attachment 6 – Cabinet Temperature Round Sheet

UNIT	CABINET	LEVEL	LOCATION	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP	TEMP
				6:00	9:00	12:00	15:00	18:00	21:00	0:00	3:00
STEAMER	0ST1	GROUND	EAST OF UNIT BY CONDENSATE PUMPS								
STEAMER	0ST2	GROUND	EAST OF UNIT BY CONDENSATE PUMPS								
STEAMER	0ST3	GROUND	SOUTH OF UNIT								
STEAMER	0ST4	GROUND	SOUTH OF UNIT								
STEAMER	0ST5	GROUND	SOUTH OF UNIT								
UNIT 1	1FW1	GROUND	NORTH OF UNIT BY BFW PUMP 1B								
UNIT 1	1FW2	GROUND	NORTH OF UNIT BY BFW PUMP 1B								
UNIT 1	1FW3	GROUND	NORTH OF UNIT BY BFW PUMP 1B								
UNIT 1	1FW4	GROUND	BY BLOWDOWN TNK								
UNIT 1	1FW5	GROUND	NORTH OF UNIT BY BFW PUMP 1A								
UNIT 1	1FW6	GROUND	NORTH OF UNIT BY BFW PUMP 1B								

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Summary

- Over $173,000 in improvements
- Updated Winter Weatherization Plant Procedure
- Improvements to the Heat Trace System
- New silver tarps, blankets and insulation
- Revised Annual Training