

DRY FORK STATION

Plant Report

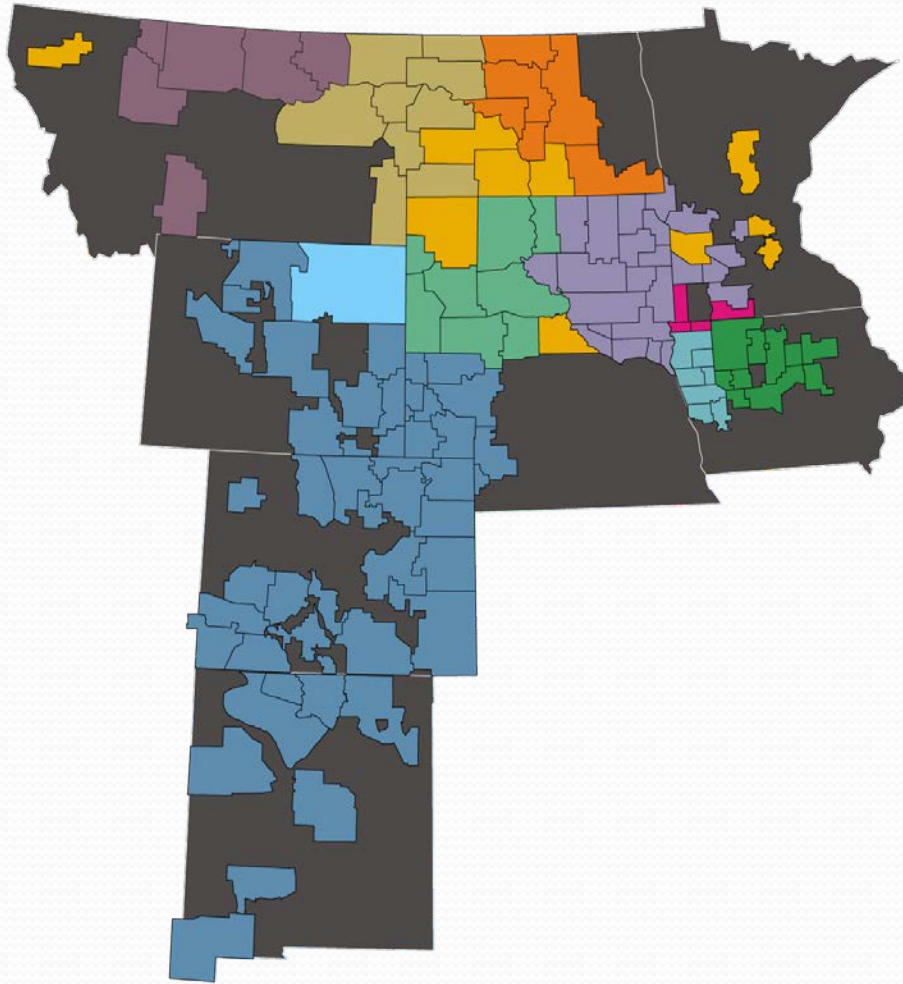
2012 ACC Users Group

Dry Fork Station - Overview



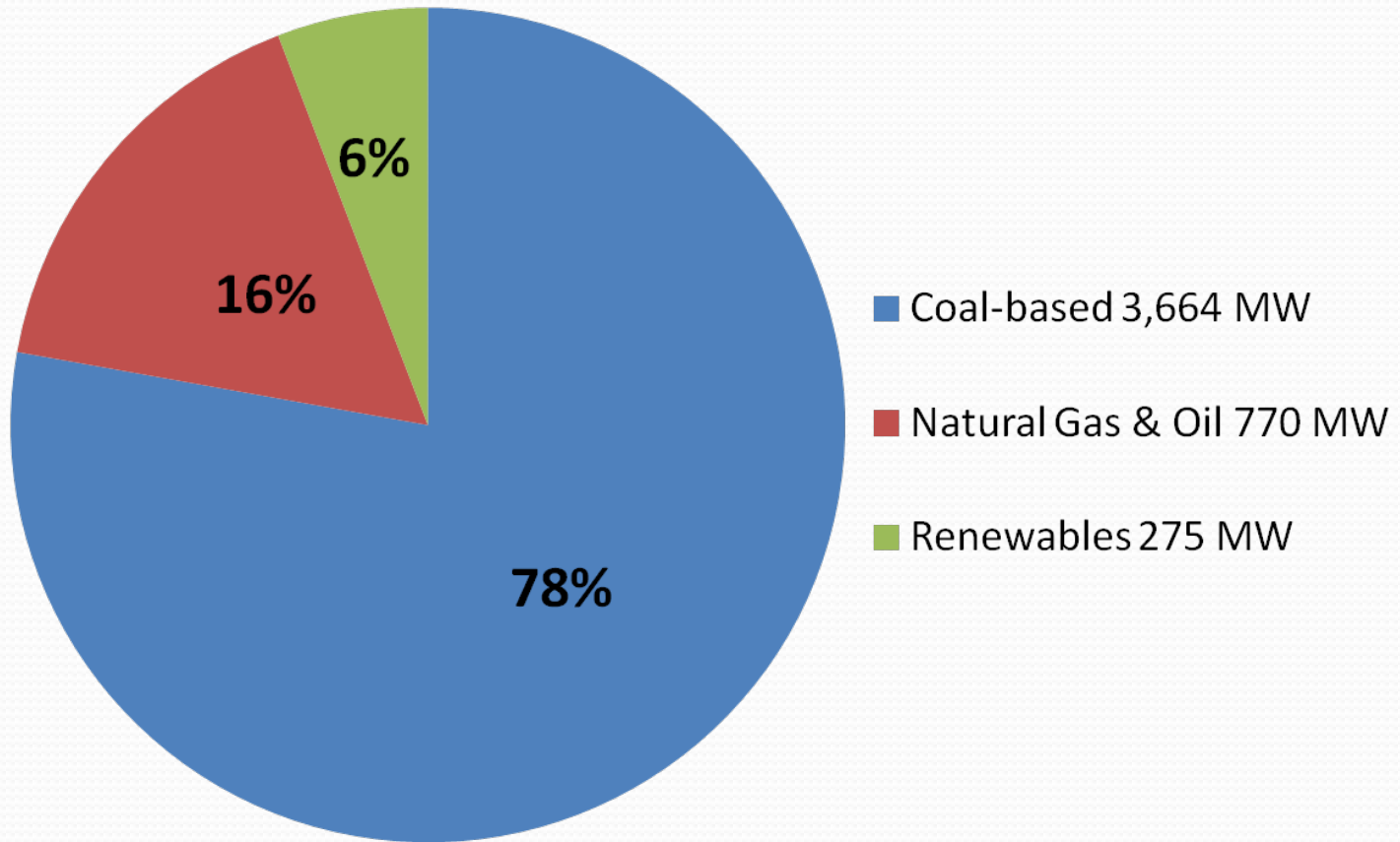
- Dry Fork Station, Gillette, WY
 - 445 MWs @ 2.2 million lbs/hr steam flow
 - Owned by Basin Electric Power Cooperative and Wyoming Municipal Power Agency
 - 92.9% Basin Electric; 7.1% WMPA

Dry Fork Station - Company Overview



- Basin Electric is headquartered in Bismarck, ND
- Incorporated in 1961
- Wholesale power supplier to 134 member cooperatives in 9 states
- 5,125 MWs of electrical generation in portfolio

Dry Fork Station – Basin's Generation Sources



Dry Fork Station – Overview

- Startup date of August 2011 and went commercial in November 2011
- Coal Fired, Mine Mouth Plant – Burn approximately 5900 Tons coal/day
- B&W Carolina Radiant Boiler with SCR
- Mitsubishi Steam Turbine
- Graf Waulf CDS scrubber

Dry Fork Station – ACC Overview

- GEA is the Air Cooled Condenser OEM
- Performance (Start-up Testing)
 - Steam Flow 1.8 Million lbs/hr
 - Back pressure 4.1 in-HgA
 - Dry Bulb Temp 83 °F
 - Load 420 MW

Dry Fork Station – ACC Maintenance

- Mechanical Maintenance problems
 - Fan hub failures
 - Bolts falling out of hubs
 - Hub threads being stripped during installation
 - Fan blades being crushed due to over torquing
 - Motor Bearing failures in all 45 motors
 - No O&M manuals for gearboxes
 - Leaky shaft seals around gearbox input shaft

Dry Fork Station – ACC Maintenance

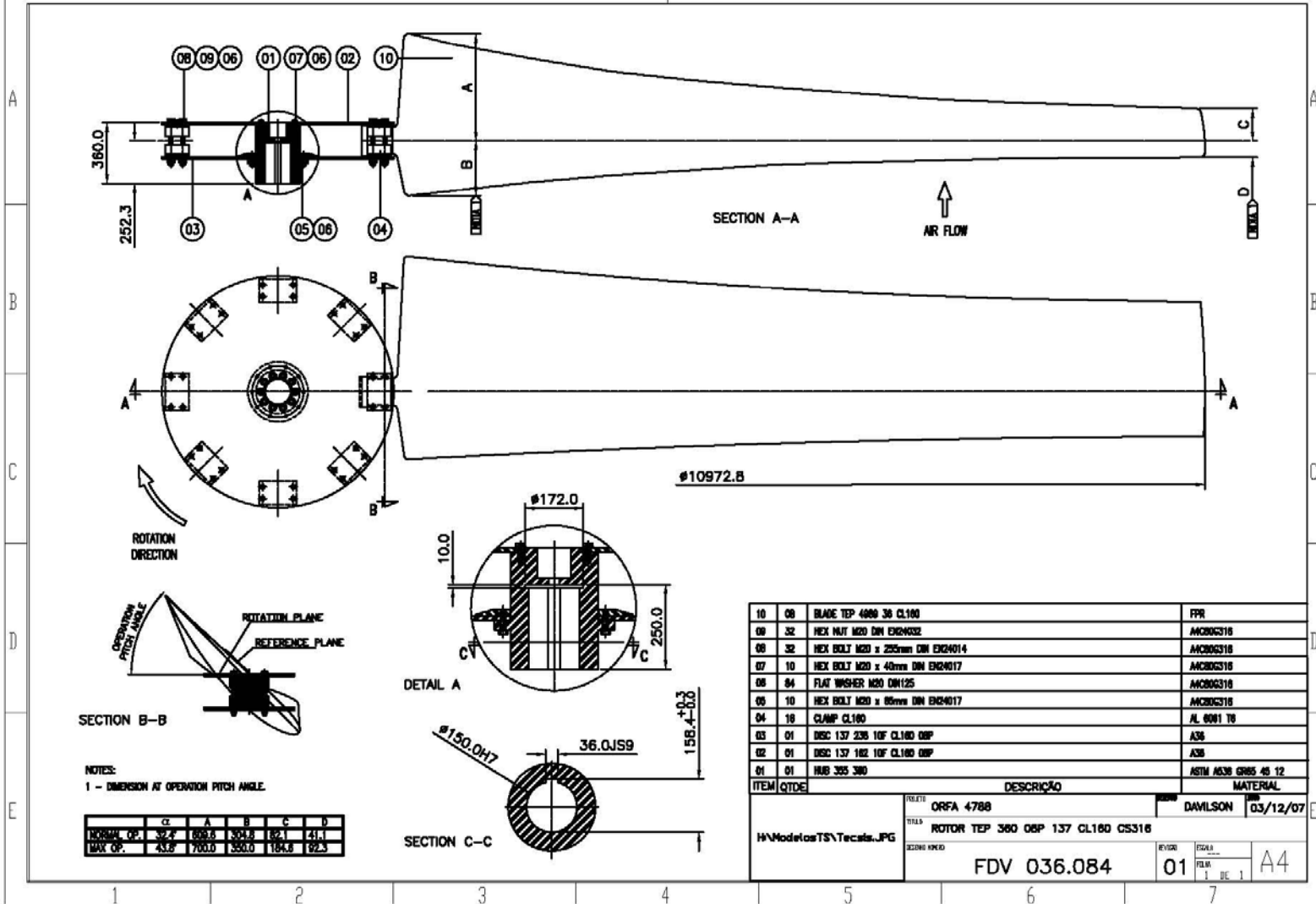
- Fan hub failures



- () NO EXCEPTION NOTED-PROCEED
- () PROCEED AS NOTED, MAKE CORRECTION AND RESUBMIT
- () REVISE AND RESUBMIT FOR APPROVAL BEFORE PROCEEDING

ESTE DOCUMENTO É PROPRIEDADE DA TECCIS. REPRODUÇÃO E DIVULGAÇÃO PROIBIDA SEM PRÉVIA AUTORIZAÇÃO.

BY _____ DATE _____



10	08	BLADE TEP 4880 36 CL180	FPR
09	32	HEX NUT M20 DIN EN24032	ACROG316
08	32	HEX BOLT M20 x 25mm DIN EN24014	ACROG316
07	10	HEX BOLT M20 x 40mm DIN EN24017	ACROG316
06	84	FLAT WASHER M20 DIN125	ACROG316
05	10	HEX BOLT M20 x 85mm DIN EN24017	ACROG316
04	18	CLAMP CL180	AL 6061 T6
03	01	DISC 137 238 10F CL180 OBP	A36
02	01	DISC 137 182 10F CL180 OBP	A36
01	01	HUB 355 380	ASTM A536 GR65 45 12
ITEM	QTD	DESCRIÇÃO	MATERIAL
		PROJETO: ORFA 4788	REVISOR: DAVILSON
		TÍTULO: ROTOR TEP 360 OBP 137 CL180 CS316	DATA: 03/12/07
		FILE: H:\Modelos\TS\Tecsis.JPG	ESCALA: A4
		FDV 036.084	01

Dry Fork Station – ACC Maintenance

- Fan hub failures



Dry Fork Station – ACC Maintenance

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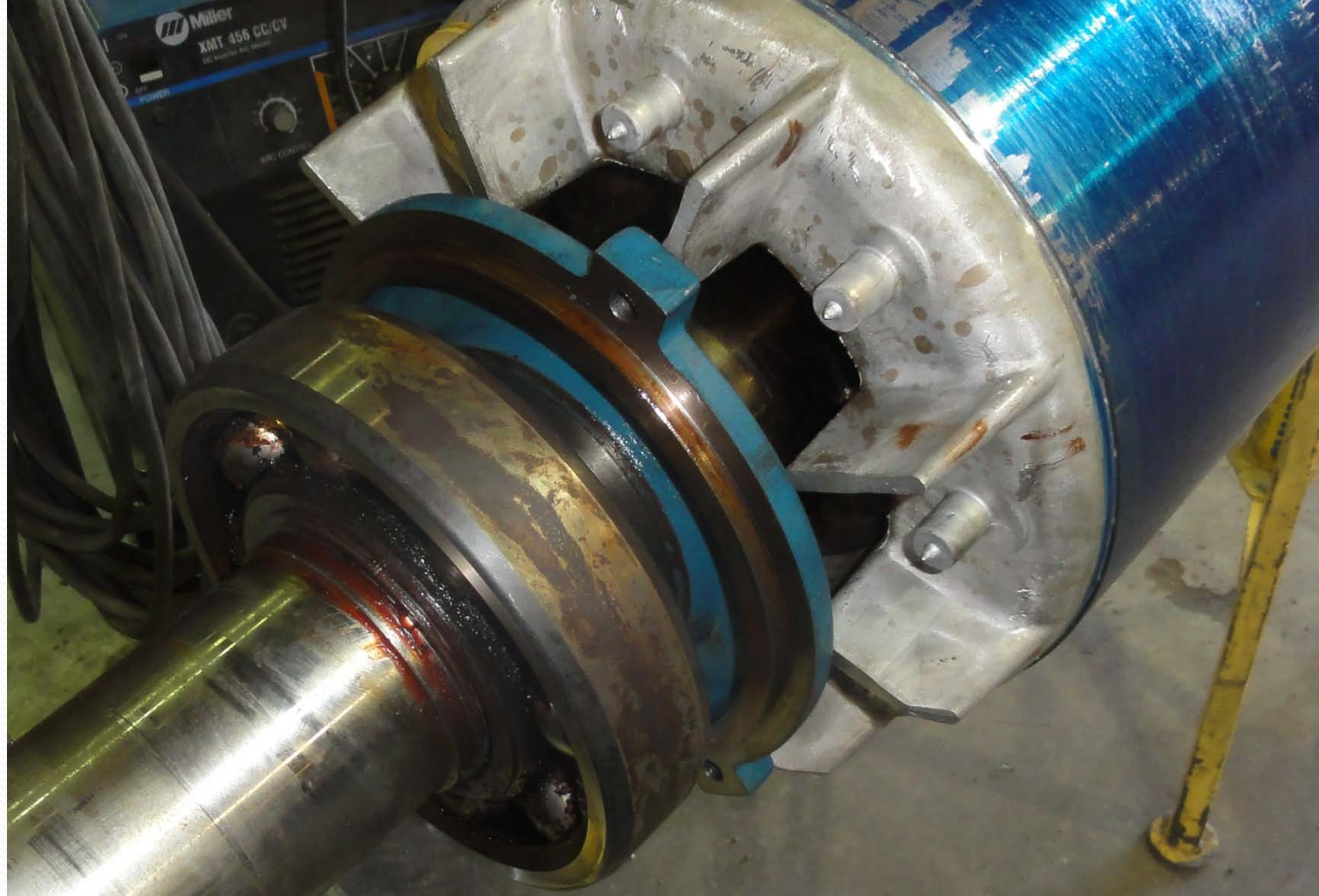
Dry Fork Station – ACC Maintenance

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Dry Fork Station – ACC Maintenance

- Motor Bearing failures in all 45 motors



Dry Fork Station – ACC Maintenance

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- Leaky shaft seals around gearbox input shaft



Dry Fork Station – ACC Operation

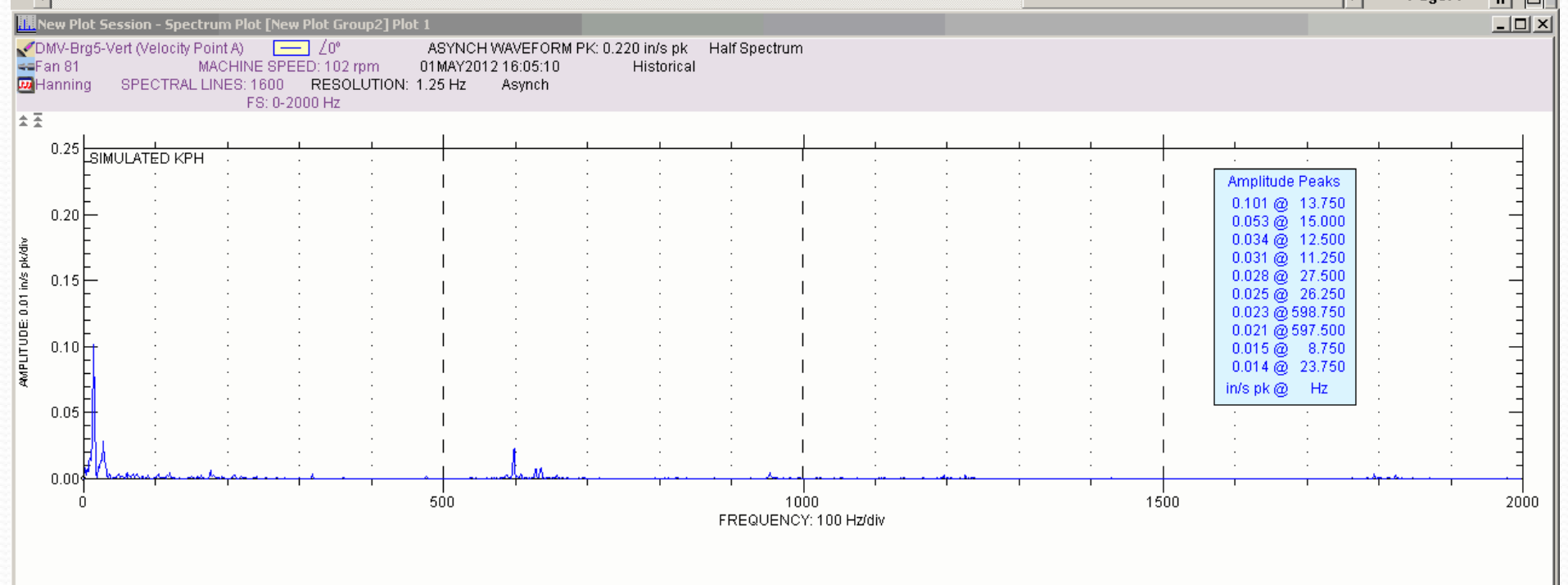
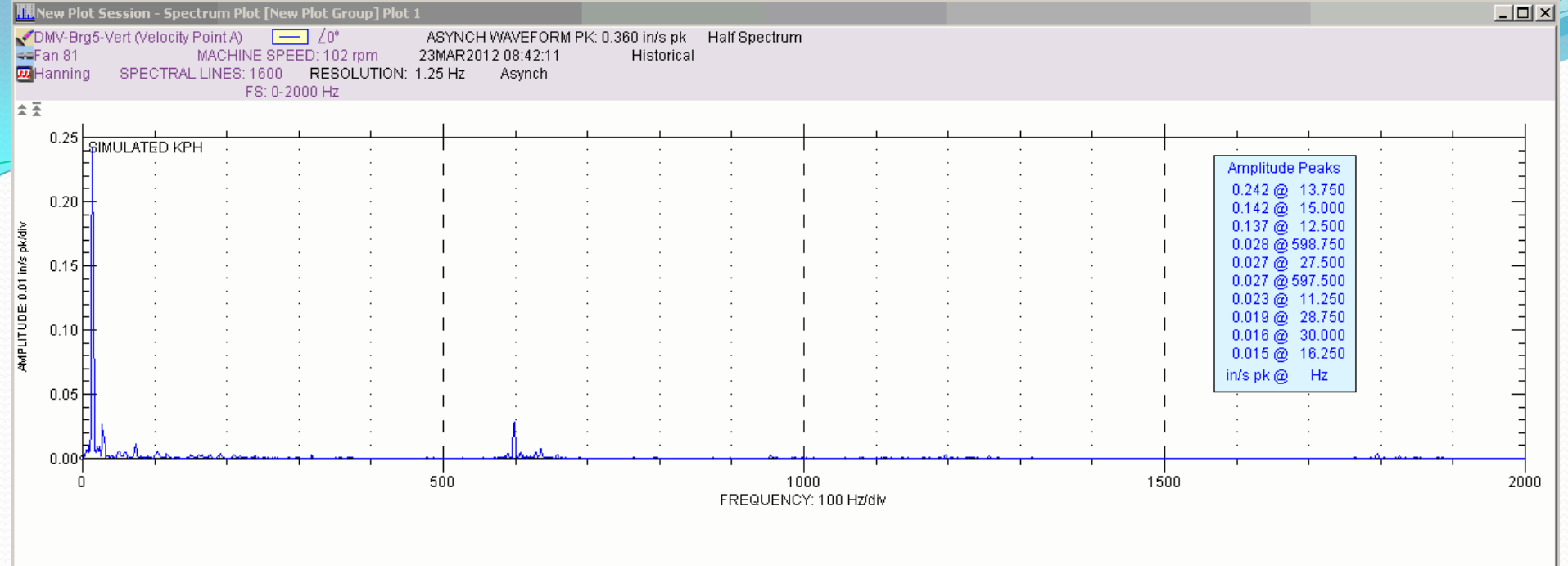
- ACC Operational problems
 - Freeze protection logic
 - Avoiding critical speeds on the fans
 - Isolation of rows in the winter time
 - Air in leakage
 - Walk downs

Dry Fork Station – ACC Design

- Condensate return line
 - Vibrates excessively under normal operation
- Fan screens located below the fan
 - Screens have no load rating
- Carbon steel piping for tube cleaning system

Dry Fork Station – ACC Performance

- ACC performance enhancements
 - Re-pitched the blades from 32.4° to 39° approach angle
 - Blade re-pitch resulted in lowering the overall vibrations of each fan by 10 to 50%



Dry Fork Station – Any Questions?

