Results and experiences with the new Putsch PKF NG

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Background

- ACSC - Hillsboro, ND Factory
  - First Campaign – 1974-75
  - 9000 tpd slice (5000 tpd original)
  - Putsch Carbonation System (1998)
  - 3 Putsch PKF-A1's (1998)
- Typical Operating Conditions (5yr average)
  - CaO/NS: 114%* (*-kiln and pebble lime)
  - Lime Loss: 0.15% on beet

Goals of Project

- Increase 1st Carbonation Filtering Capacity
- Increase Carbonation stability
- Decrease lime cake sugar loss

PKF NG - Features

- Hydraulic
  - Single hydraulic pump
- Washing Machine
  - Light beam vs. proximity switches
- Safety
  - Safety doors

Old PKF Hydraulics

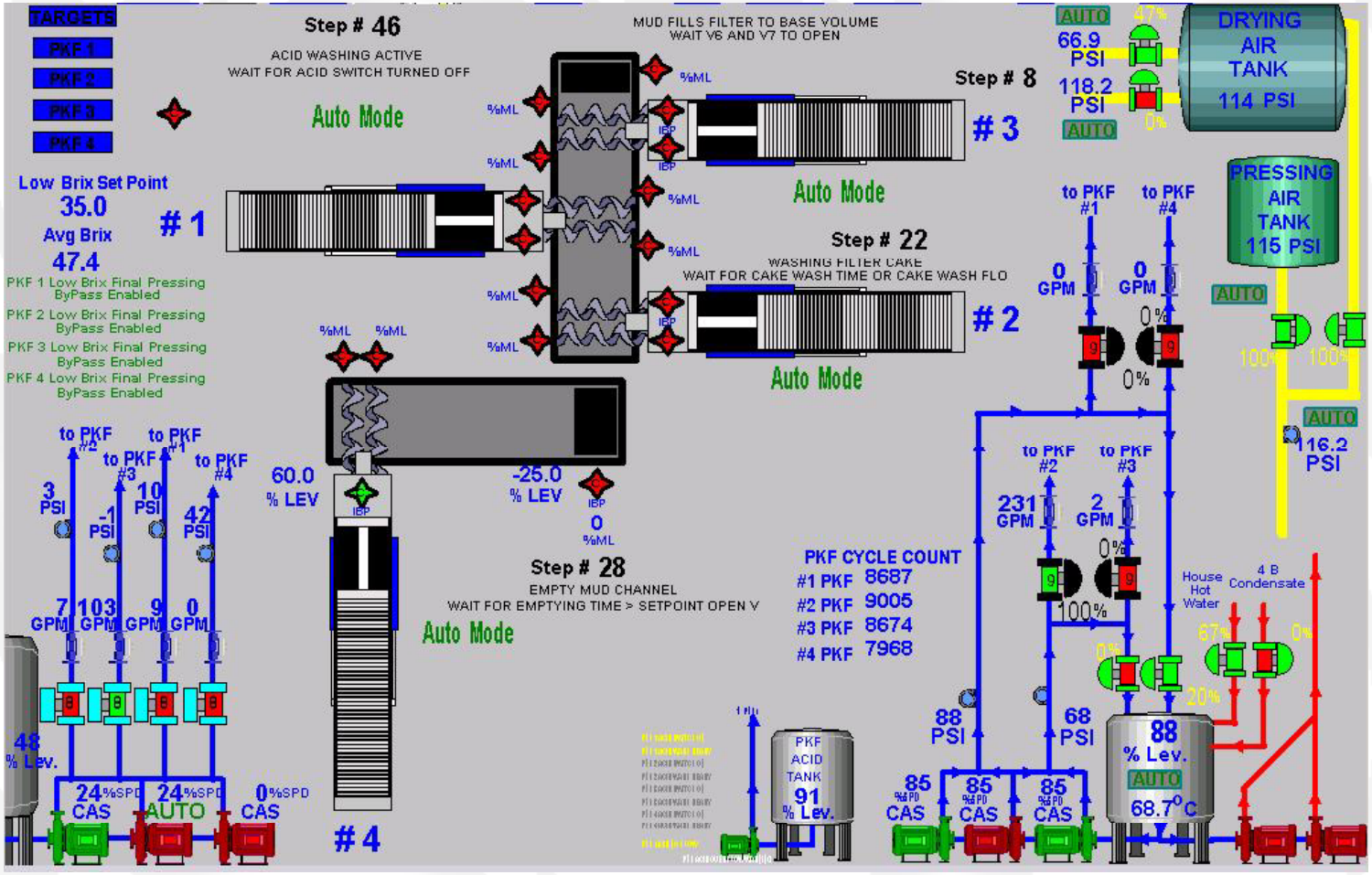
New PKF NG Hydraulics

PKF NG Installation

PKF Operational Changes

- PKF Piping
  - Individual feed, filtrate and wash
- Automatic control of Final Pressing
  - Based upon mud density

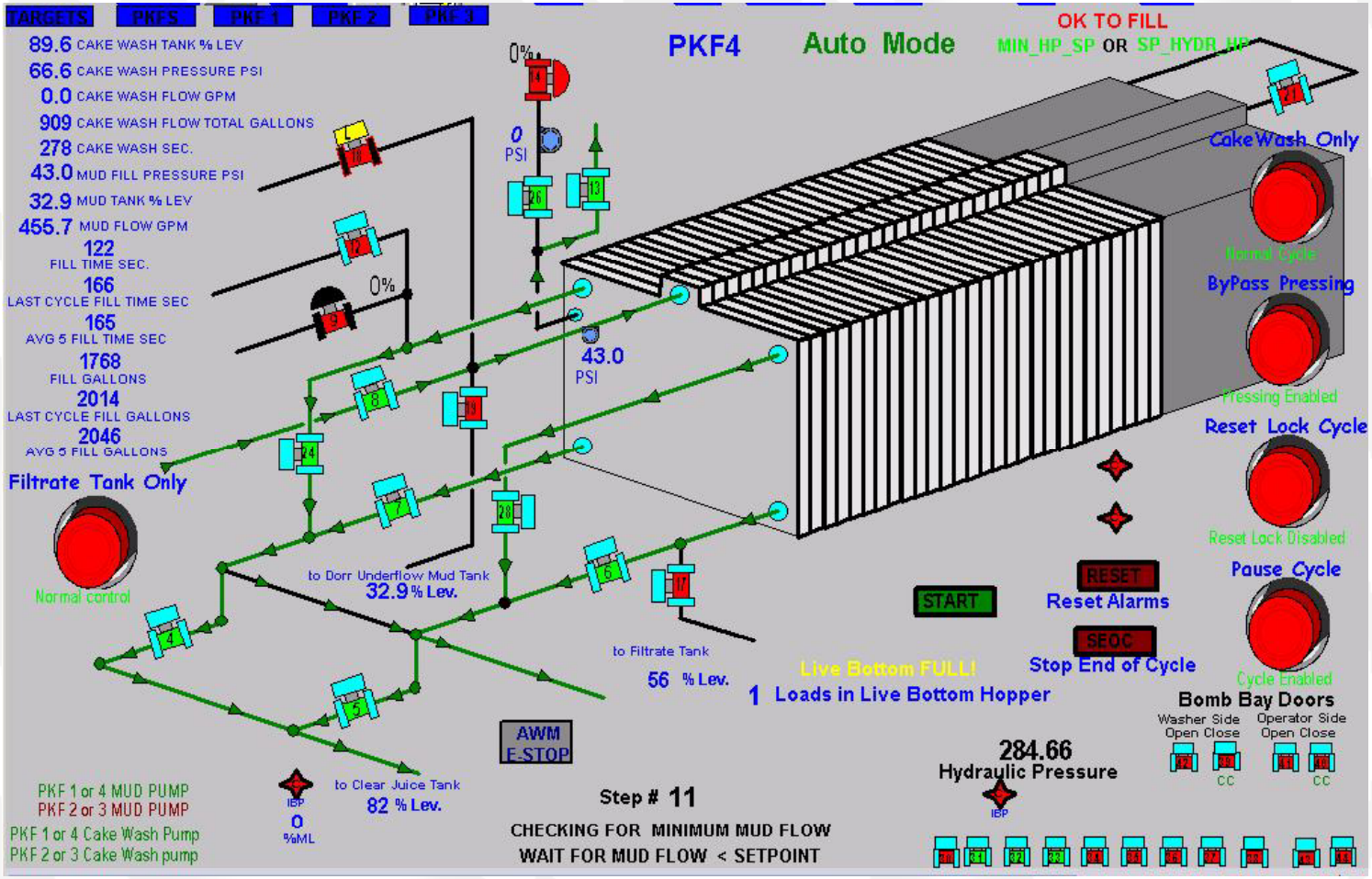
PKF Operations



PKF Operational Changes

- PKF Piping
  - Individual feed, filtrate and wash
- Automatic control of Final Pressing
  - Based upon mud density
- Cleaning of Mud Channel
  - Water and Air
- PKF
  - Pres d

PKF Operations



PKF Operational Changes

- PKF Piping
  - Individual feed, filtrate and wash
- Automatic control of Final Pressing
  - Based upon mud density
- Cleaning of Mud Channel
  - Water and Air
- PKF Filling
  - Pressure-based fills

PKF Operations

PKF 1 | PKF 2 | PKF 3 | PKF 4 | PKF 5

PKF TARGETS

	Min Max Sec,Gal	# 1 PKF Preset	# 1 PKF Actual	# 2 PKF Preset	# 2 PKF Actual	# 3 PKF Preset	# 3 PKF Actual	# 4 PKF Preset	# 4 PKF Actual
PRE-PRESSING TIME (step15)	(40-60)	45	61	45	65	45	39	45	62
INTERMEDIATE PRESSING TIME (step 18)	(50-70)	65	65	65	65	65	65	65	66
CAKE WASH TIME (step 22)	(800-900)	900	253	900	205	900	220	900	270
FINAL PRESSING TIME (step 24)	(90-110)	90	91	90	91	90	91	90	91
CAKE DRYING TIME (step 26)	(90-120)	120	121	120	44	120	121	120	121
FEED CHANNEL CLEANING TIME (step 28)	(20-30)	20	21	20	0	20	21	20	21
FEED CHANNEL DRYING TIME (step 29)	(20-30)	20	21	20	0	20	21	20	2
AIR RELEASE TIME (step 31)	(20-60)	30	31	30	0	30	31	30	31
MUD FILLING PRESSURE SP	(50-150)	95.0	32.9	95.0	13.7	95.0	-0.9	95.0	-0.2
BASE MUD VOLUME (gallons)	(1400-1600)	1400	2048	1400	2106	1400	2435	1400	0
MINIMUM MUD FLOW (gallons)	(150-400)	250	9	250	7	250	8	250	0
MAX MUD TOTAL (gallons)	(1800-3500)	2650	2048	2650	2106	2650	2435	2650	0
WASH WATER VOLUME (gallons)	(500-1000)	900	943	900	951	900	0	900	908
FILL TIME (overrides gallons)	(500-1500)	1000	175	1000	167	1000	198	1000	167
LAST 5 FILL TIMES AVERAGE	(20)	171	171	166	166	201	201	167	167
PRE-PRESSING AIR PRESSURE (step 15)	(35)	35	-1	35	97	35	20	35	0
INTERM PRESSING AIR PRESSURE (step 18)	(45)	65	-1	65	97	65	20	65	0
FINAL PRESSING AIR PRESSURE (step 24)	(90)	90	-1	90	97	90	20	90	0

Other Operational Changes

- Scale Removal
  - Straining 1st Carbonation scale
- 1st Carb Mud Density
- Carbonation
  - Mixed Juice tank
  - Milk of Lime addition
  - Coagulant addition

1st Carb Scale Screen

Results

- Lime Cake Sugar Loss decreased ~45%
  - 0.15% to 0.08%
- Carbonation/Filtration Station
  - Steadier Operation
  - 50% reduction in 1st Carb mud tank upsets

Questions