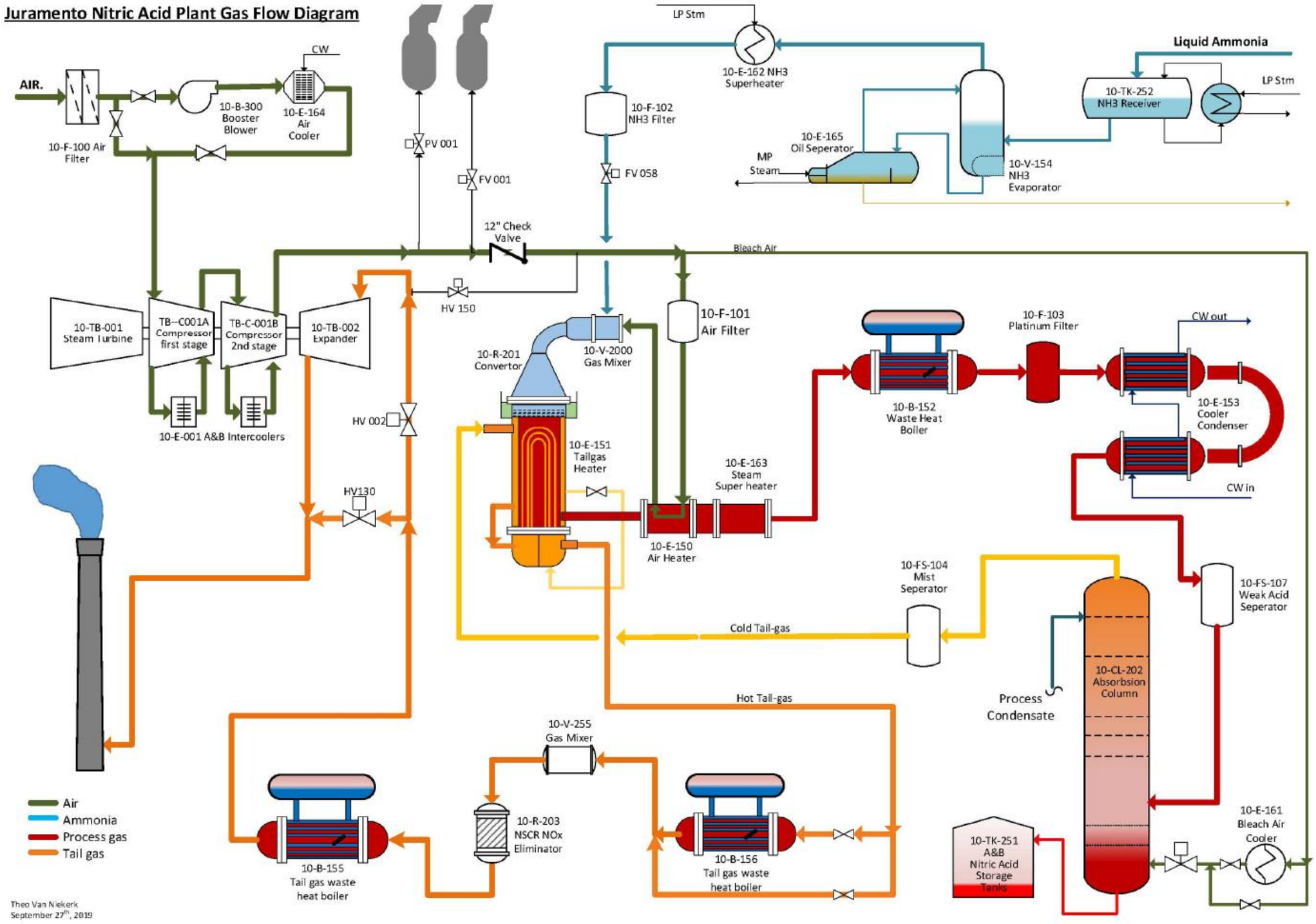
1	General plant information	
1.1	Plant type (Dual Pressure/Mono-High/Mono-Medium/Mono-Low)	Mono-High
1.2	Reactor supplier (Grande Paroisse , Uhde , Wetherley , other)	Girdler
1.3	Year of start-up	First commissioning in the 1960s (Canada) and new commissioning and EMP in mid-2018 (Argentina).
1.4	Number of reactors	1
1.5	Reactor pressure (bar, abs)	10
1.6a	Reactor internal diameter in mm (basket) (10-E-151)	756 mm (Circular)
1.6a	Reactor internal diameter in mm (basket) (10-R-201)	831,85 mm (Circular)
1.7	Gauze temperature (°C) (With new gauze)	910°C
1.8	Production rate, design (100% Metric Tons HNO_3 /day)	180
1.9	Production rate, real (100% Metric Tons HNO_3 /day)	170
1.10	HNO_3 concentration in the final product (%)	56
1.11	Normal duration of the productive campaign (months)	3
1.12	Operation time (days per year)	330
1.13a	Ammonia flow to reactor (kg/h)	2.221
1.13b	Ammonia flow to reactor (Nm3/h)	2.892
1.14a	Primary air flow to ammonia reactor (kg /h)	33.168
1.14b	Primary air flow to ammonia reactor (Nm^3 /h)	25.711
1.15a	Secondary air flow (kg /h)	4.495
1.15b	Secondary air flow (Nm^3 /h)	3.333
1.16	Temperature of the gas mixture (air/NH_3) to the reactor (°C)	240
1.17	Conversion efficiency of the plant at the beginning of the campaign (% or kgNH_3 /teHNO_3)	0.99
1.18	Plant conversion efficiency at the end of the campaign (%)	88-91
2	**Pt gauze per reactor**	
2.1	Material (Pt% / Rh%)	95/5
2.2	Diameter (mm)	831,85 mm (Circular)
2.3	Number of gauze	Cant: 13 X 3
2.4	Gauze supplier	Hereaus
3	**Change of Pt gauze per reactor**	
3.1	Average number of stops per campaign in the last three campaigns	2 (one scheduled for mesh change and one unplanned stoppage)

3.2	Number of stops that were not planned	1
3.3	Date of next scheduled stoppage	Approx.Every 3 months for a mesh change and a general shutdown plant
3.4	Planned changes to the composition of Pt gauze in the future?	NO
4	**Reactor Basket / Pressure Drop Data**	
4.1	Type of support system installed (basket with Raschig rings , others)	Mesh: Nickel / Chrome
4.2	Support system depth (mm)	142,87mm
4.3	Available depth for a secondary catalyst under gauze (mm)	242,89mmDistance between the mesh and the top of the exchanger tubes
5	**NSCR and tail gas information**	
5.1	NOx abatement unit installed (Yes / No)	Yes
5.2	NOx abatement unit	Before expand(between boilers 10-BO-155/156)
5.3	NOx reduction system type (SCR /NSCR)	NSCR
5.4	NSCR catalyst (precious metal, base metal, zeolite)	Pt-Rh-Pd Impregnating in ceramic base
5.5	NSCR Catalyst Supplier	ECS
5.6	Maximum temperature allowed in the NSCR reactor (°C)	732
5.7	NSCR catalyst age (years)	Lifespan: 3-4 years Last upload: April 2023
5.8	NOx regulation limit (ppm)	50
5.9	NOx content before the reactor (ppm)	5,500
5.10	NOx content after reactor (ppm)	< 50
5.11a	Gas flow before NSCR (kg/h / h)	29.348
5.11b	Gas flow before NSCR (Nm 3 / h)	23.243
5.12a	Gas flow after NSCR (kg/h /h)	29.518
5.12b	Gas flow after NSCR (Nm^3 /h)	23.083
5.13	Tail gas temperature at the outlet of the absorption tower (°C)	28-34
5.14	Tail gas temperature (°C) before NSCR	470 - 485
5.15	Tail gas temperature (°C) after NSCR	710 - 730
5.16	NSCR O2 content (% vol.)	1.3 – 1.5% (up to 2.5% could be achieved but due to the requirements of the current abatement

		system it operates between 1.3-1.5%)
5.17	Tail gas temperature (°C) before expander	590 - 610
5.18	Tail gas temperature (°C) before expander (max. Allowable)	640
5.19	Tail gas temperature (°C) after turbine	240 - 270
5.20	Tail gas pressure at the outlet of the absorption tower (bar a)	7.7-8.2
5.21	Tail gas pressure at the absorption tower inlet (bar a)	8.7-9.2
5.22	Tail gas pressure (bar a) before turbine	7.5-8.0
5.23	Tail gas pressure (bar absolute) after turbine	~1
	Reducing agents for NSCR:	
5.24	• Ammonia Plant Purge Gas Flow (kg/h) • Natural Gas flow	360 kg/h 200 kg/h
5.25	• Purge gas composition • Natural Gas Composition	30 % CH4; 7 % H2; 26 % Ar; 37% N291% CH4 – 5,5% C2H6– 0,5% C3H8 – 0,2% C4H10 – 2,8% otros
6	**Chimney information**	
6.2	Distance from chimney to control room (m)	100 aprox
6.3	Distance from sampling location (possible/existing) at chimney to ground level	30
6.4	Sampling platform required (Yes/No)	No
6.5	Access to the sampling platform (stairs)	Through stairs
6.6	O_2 content in tail gases (% vol.)	0%
6.7	Maximum allowable additional pressure drop caused by the tertiary reduction system	0.2 kg/cm2g
7	**Steam generation with NSCR heat exchanger** The pre- and post-NSCR boilers are considered.	
7.1	Steam flow generated (kg/h)	2650
7.2	Generated steam temperature (°C)	230
7.3	Generated steam pressure (bar)	15 – 15,5
7.4	Use of generated steam	Turbine


Juramento Nitric Acid Plant Gas Flow Diagram
AIR.
CW
10-F-100 Air Filter
10-B-300 Booster Blower
10-E-164 Air Cooler
10-E-001 A&B Intercoolers
PV 001
FV 001
12" Check Valve
HV 150
HV 002
HV130
10-TB-001 Steam Turbine
TB--C001A Compressor first stage
TB-C-001B Compressor 2nd stage
10-TB-002 Expander
LP Stm
10-E-162 NH3 Superheater
10-F-102 NH3 Filter
FV 058
10-E-165 Oil Seperator
MP Steam
10-V-154 NH3 Evaporator
Liquid Ammonia
10-TK-252 NH3 Receiver
LP Stm
Bleach Air
10-F-101 Air Filter
10-R-201 Convertor
10-V-2000 Gas Mixer
10-E-151 Tailgas Heater
10-E-163 Steam Super heater
10-E-150 Air Heater
10-B-152 Waste Heat Boiler
10-F-103 Platinum Filter
CW out
10-E-153 Cooler Condenser
CW in
10-FS-104 Mist Seperator
10-FS-107 Weak Acid Seperator
Cold Tail-gas
Hot Tail-gas
Process Condensate
10-CL-202 Absorbsion Column
10-V-255 Gas Mixer
10-R-203 NSCR NOx Eliminator
10-B-155 Tail gas waste heat boiler
10-B-156 Tail gas waste heat boiler
10-E-161 Bleach Air Cooler
10-TK-251 A&B Nitric Acid Storage Tanks
Air
Ammonia
Process gas
Tail gas
Theo Van Niekerk
September 27th, 2019