


- DESIGN NOTES TO SHEET 1:**
- Oxygen line sizing done with a linear velocity of 4m/s (ALARA).
  - Signal must be provided to the PLCs of the FDP and NW PlasGas facilities.
  - T1602 will be a vendor package, i.e. a bulk liquid storage tank c/w the evaporator, necessary shutoff valves, regulator(s) and safety relief valve(s) to regulate the gas supply pressure at 600 kPa(g). The tank will be equipped with instrumentation indicating the pressure and liquid inventory of the tank.
  - Vent to safe location, i.e. to atmosphere outside of the building above roof level.
  - Pressure regulator to be supplied c/w pressure indicators on the in- and outlet side of the valve.
  - Piping between cylinder header and pressure regulator to be as short as practically possible.
  - Connection for process piping pressure swing blow out to remove debris from construction; minimising impingement sites.
  - Process piping to be chemically cleaned and degreased for Oxygen service.
  - Bypass line for slow pressurisation of downstream piping to minimise impingement.
  - Valve size will be determined when Process Protection Calculations are done. The supplier to advise on pressure relief valve size during procurement, based on nozzle area specified by Necsa.
  - Deadman valve.
  - Bullnose c/w fitting to be purchased.
  - Facilities provide their own pressure regulators.

FUNCTION	NAME	DESIGNATION	SIGNATURE	REVISION HISTORY			
				REV	DESCRIPTION	PREPARED	DATE
PREPARED	Mr W Ludwick	Senior Process Engineer		1	First Issue	W Ludwick	2024/08/01
REVIEWED	Mr N Manilal	Process Engineer		1.1	Update after BDOR and change in number of cylinders for Argon (6 to 2).	W Ludwick	2024/10/09
REVIEWED	Mr BM Khumalo	Senior Process Engineer		2	Second Issue	W Ludwick	2024/10/15
REVIEWED	Mr SR Mngoma	Chief Engineer Mechanical		3	Update after Control Review	P Dube	2024/11/26
REVIEWED	Dr G Manuel	Chief Engineer Control & Instrumentation		4	Update after HAZOP 3	P Dube	2025/01/22
REVIEWED	Mr WJ van den Berg	Chief Engineer Electrical		5	Update after HAZOP 3 Close-out report and valve list	W Ludwick	2025/04/14
APPROVED	Dr K Moodley	Chief Process Engineer					

LIST OF REFERENCED P&IDs & DOCUMENTS	
1)	ENS-WOPVR-LST-24003 – Lead Sheet for the PFDs & P&IDs of the WOPG Demonstration Facility
2)	ENS-WOPVR-PID-24001 – P&ID for the Plasma Gasification System of the WOPG Demonstration Facility
3)	ENS-FDP-PID-24005 – Gas Supply System 833
4)	ENS-NWPVR-PID-24004 – NW PlasGas Demonstration Plant Subsystem 13



South African Nuclear Energy Corporation SOC Limited

**PROJECT**  
URANIUM CONTAMINATED WASTE OIL PLASMA GASIFICATION

**TITLE**  
P&ID – GAS SUPPLY SYSTEM (O<sub>2</sub> & Ar)

**DRG. NO.**  
ENS-OWPVR-PID-24003

**DRAWN BY**  
W LUDWICK

**DATE**  
2025/04/14

**DESTROY ALL PREVIOUS PRINTS**

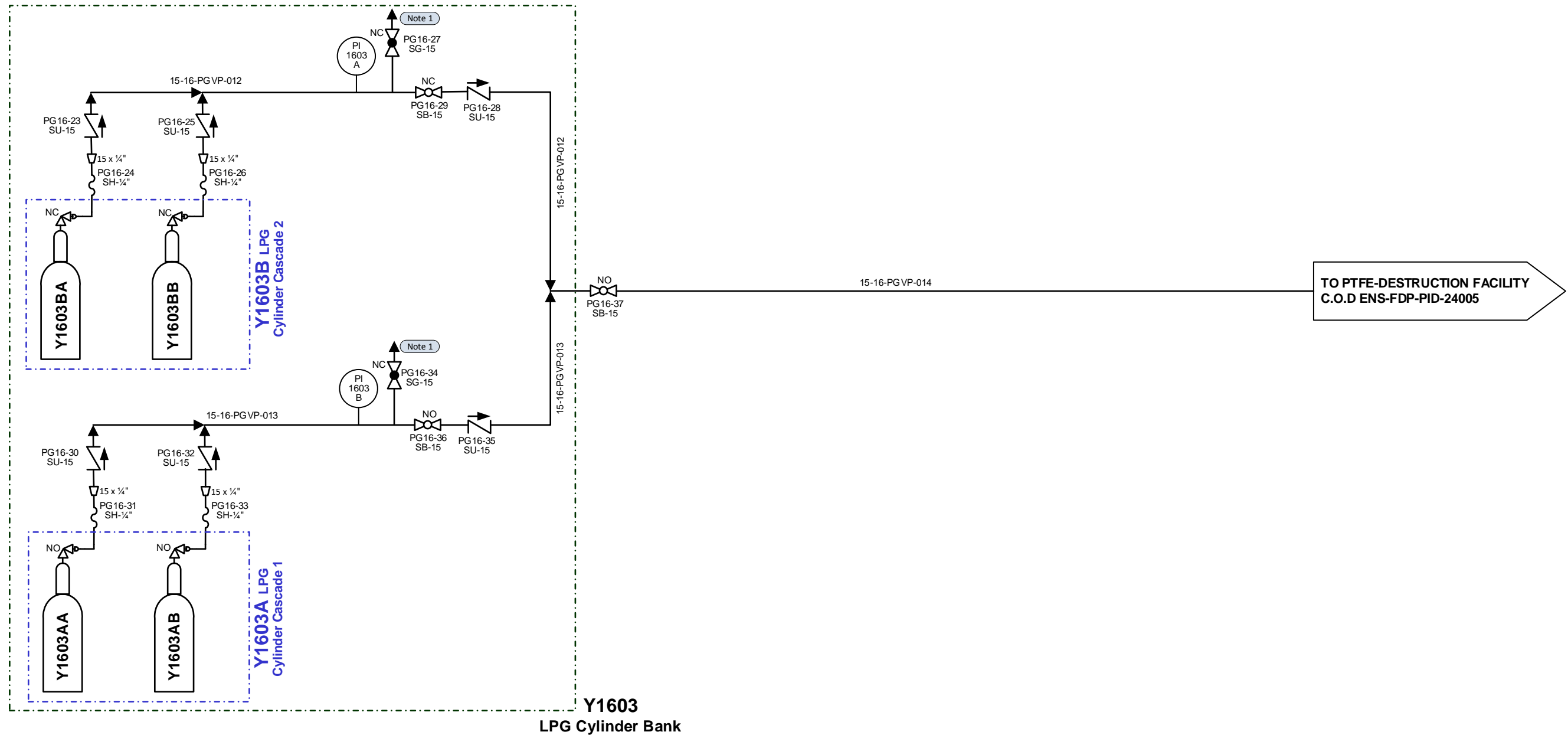
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**REVISION**

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**Classification:**  
**CONFIDENTIAL**


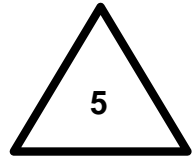
**SHEET 1 OF 3**

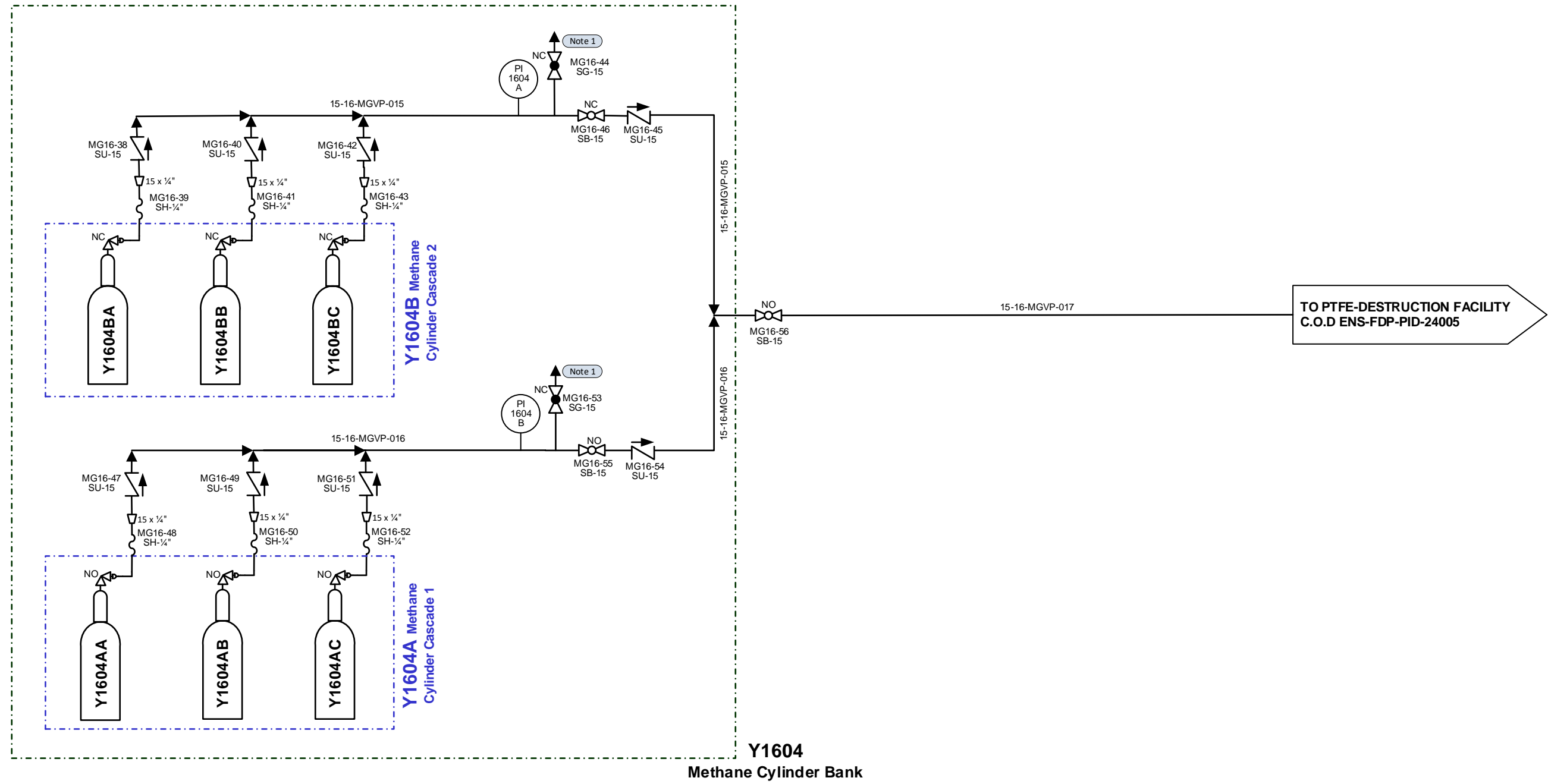


**DESIGN NOTES TO SHEET 2:**

- 1) Vent to safe location, i.e. to atmosphere outside of building above roof level, but facing away from the discharge point of the Oxygen vent line.
- 2) Piping between cylinder header and pressure regulator to be as short as practically possible.
- 3) Process piping to be chemically cleaned and degreased for Oxygen service as additional safety measure.
- 4) In the case of > 2 cylinders, the minimum distance from a boundary wall should be 3m. If the boundary is a firewall, cylinders may be placed directly against the boundary wall. (SANS 10087)
- 5) Minimum distance to drains (low accumulation points) from cylinders to be ≥ 2 m. (SANS 10087)

FUNCTION	NAME	DESIGNATION	SIGNATURE	REVISION HISTORY			
				REV	DESCRIPTION	PREPARED	DATE
PREPARED	Mr W Ludwick	Senior Process Engineer		1	First Issue	W Ludwick	2024/08/02
REVIEWED	Mr N Manilal	Process Engineer		1.1	Change in number of cylinders for LPG (6 to 4).	W Ludwick	2024/10/09
				2	Second Issue	W Ludwick	2024/10/15
				3	Update after Control Review	P Dube	2024/11/26
				4	Updated after HAZOP 3	P Dube	2025/01/22
				5	Updated after HAZOP 3 Close-out report and valve list	W Ludwick	2025/04/14
				LIST OF REFERENCED P&IDs & DOCUMENTS			
				1) ENS-WOPVR-LST-24003 – Lead Sheet for the PFDs & P&IDs of the WOPG Demonstration Facility			
				2) ENS-FDP-PID-24005 – Gas Supply System 833			
APPROVED	Dr K Moodley	Chief Process Engineer					

 South African Nuclear Energy Corporation SOC Limited	PROJECT	<b>URANIUM CONTAMINATED WASTE OIL PLASMA GASIFICATION</b>		<b>DESTROY ALL PREVIOUS PRINTS</b>  <b>REVISION</b>
	TITLE	<b>P&amp;ID – GAS SUPPLY SYSTEM (LPG)</b>		
DRG. NO.	<b>ENS-OWPVR-PID-24003</b>			
<b>Classification:</b> <b>CONFIDENTIAL</b>	DRAWN BY	WLUDWICK	<b>SHEET 2 OF 3</b>	
	DATE	2025/04/14		



**Y1604**  
Methane Cylinder Bank

**DESIGN NOTES TO SHEET 3:**

- 1) Vent to safe location, i.e. to atmosphere outside of building above roof level, but facing away from the discharge points of the Oxygen and LPG vent lines.
- 2) Piping between cylinder header and pressure regulator to be as short as practically possible.
- 3) Process piping to be chemically cleaned and degreased for Oxygen service as additional safety measure.

FUNCTION	NAME	DESIGNATION	SIGNATURE
PREPARED	Mr W Ludwick	Senior Process Engineer	
REVIEWED	Mr N Manilal	Process Engineer	
REVIEWED	Mr BM Khumalo	Senior Process Engineer	
REVIEWED	Mr SR Mngoma	Chief Engineer Mechanical	
REVIEWED	Dr G Manuel	Chief Engineer Control & Instrumentation	
REVIEWED	Mr WJ van den Berg	Chief Engineer Electrical	
APPROVED	Dr K Moodley	Chief Process Engineer	

REVISION HISTORY			
REV	DESCRIPTION	PREPARED	DATE
1	First Issue	W Ludwick	2024/07/24
1.1	Change in number of cylinders for Methane (8 to 6).	W Ludwick	2024/08/02
2	Second Issue	W Ludwick	2024/10/09
3	Update after Control Review	P Dube	2024/10/15
4	Updated after HAZOP 3	P Dube	2024/11/26
5	Updated after HAZOP 3 Close-out report	W Ludwick	2025/04/14

LIST OF REFERENCED P&IDs & DOCUMENTS	
1)	ENS-WOPVR-LST-24003 – Lead Sheet for the PFDs & P&IDs of the WOPG Demonstration Facility
2)	ENS-FDP-PID-24005 – Gas Supply System 833

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**Classification:**  
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PROJECT	<b>URANIUM CONTAMINATED WASTE OIL PLASMA GASIFICATION</b>	
TITLE	<b>P&amp;ID – GAS SUPPLY SYSTEM (CH<sub>4</sub>)</b>	
DRG. NO.	<b>ENS-OWPVR-PID-24003</b>	
DRAWN BY	WLUDWICK	<b>SHEET 3 OF 3</b>
DATE	2025/04/14	

**DESTROY ALL PREVIOUS PRINTS**

**5**

**REVISION**