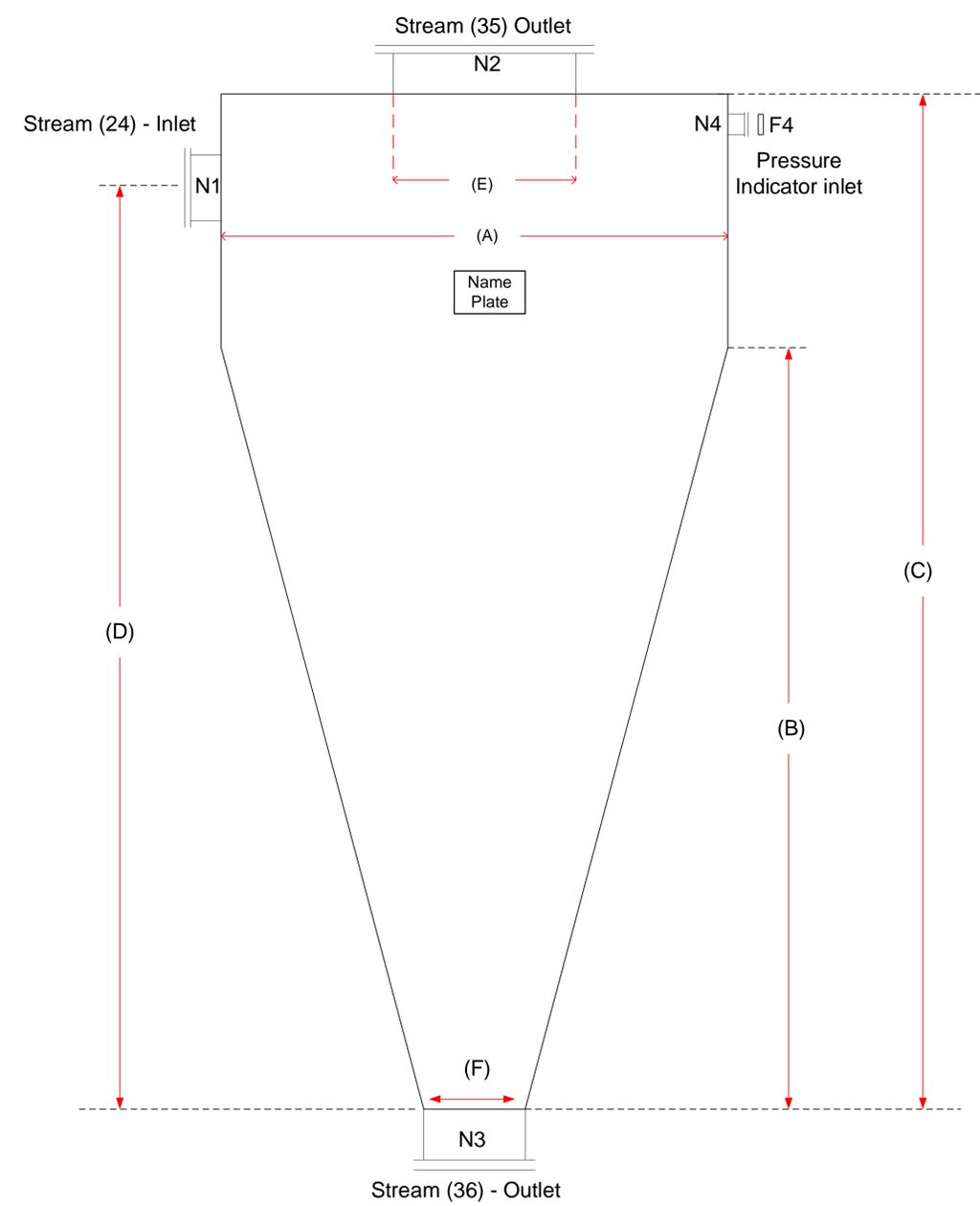


DO NOT SCALE!



IF IN DOUBT, ASK



|  |   |  |                         |
|--|---|--|-------------------------|
| <b>DESCRIPTION</b>                         |   | Cyclone Y1301 is used to remove loose solid particles (typically U <sub>3</sub> O <sub>8</sub> , together with other metal oxides and possibly carbon residue) that are entrained in a gas stream exiting a quench H1206, prior to the gas entering a downstream wet scrubber S1501 via a liquid ring vacuum pump P1520. |                         |
| <b>LOCATION</b>                            |   | Oil Waste Plasma Gasification Demonstration Facility – Inside Secondary Enclosure Y1410 inside laboratory 150, Building V-H2, Necsa, Pelindaba   |                         |
| <b>SAFETY CLASSIFICATION</b>               |   | SC-3 (N) and QC-2 (C)  |                         |
| <b>QUALITY CLASSIFICATION</b>              |   | SC-3 (N) and QC-2 (C)  |                         |
| <b>FLUID PROPERTIES</b>                    |   |  |                         |
| STREAM NUMBER                              | 24  | 35   | 36                      |
| STREAM DESCRIPTION                         | Off-gas   | Solids-free Off-gas  | Solids                  |
| VOLUMETRIC FLOWRATE IN (m <sup>3</sup> /h) | 71.62   | 72.54  | 1.54x10 <sup>6</sup>    |
| MASS FLOWRATE (kg/h)                       | 57.93   | 57.92  | 1.28x10 <sup>2</sup>    |
| MOLE FLOWRATE (kmol/h)                     | 1.89  | 1.89   | 1.52x10 <sup>5</sup>    |
| PHASES                                     | GAS   | GAS  | SOLIDS                  |
| OPERATING TEMPERATURE (°C)                 | 90  | 90   | 90                      |
| OPERATING PRESSURE (kPa(g))                | -7.93   | -8.93  | < ATM                   |
| AVERAGE PARTICLE SIZE (µm)                 | 1 - 3   | 1 - 3  | 1 - 3                   |
| <b>COMPONENT CONCENTRATION (Mass%)</b>     |   |  |                         |
| O <sub>2</sub>                             | Oxygen  | 14.82  | 14.82                   |
| N <sub>2</sub>                             | Nitrogen  | 8.63   | 8.63                    |
| HF   | Hydrogen Fluoride   | 0.006  | 0.006                   |
| HCl  | Hydrogen Chloride   | 0.037  | 0.037                   |
| CO <sub>2</sub>                            | Carbon Dioxide  | 53.67  | 53.68                   |
| H <sub>2</sub> O                           | Water   | 22.81  | 22.82                   |
| U <sub>3</sub> O <sub>8</sub>              | Triuranium Octoxide   | 0.023  | 4.5x10 <sup>-4</sup>    |
| <b>COMPONENT MASS FLOWRATE (kg/h)</b>      |   |  |                         |
| O <sub>2</sub>                             | Oxygen  | 8.59   | 8.59                    |
| N <sub>2</sub>                             | Nitrogen  | 5  | 5                       |
| HF   | Hydrogen Fluoride   | 0.0037   | 0.0037                  |
| HCl  | Hydrogen Chloride   | 0.02   | 0.02                    |
| CO <sub>2</sub>                            | Carbon Dioxide  | 31.09  | 31.09                   |
| H <sub>2</sub> O                           | Water   | 13.22  | 13.22                   |
| U <sub>3</sub> O <sub>8</sub>              | Triuranium Octoxide   | 0.013  | 0.000261                |
| <b>CORROSIVE DUE TO</b>                    |   | HCl and HF   |                         |
| <b>MASS EMPTY (kg)</b>                     | Supplier to advise  | <b>CORROSION ALLOWANCE (mm)</b>  | 0" (Supplier to advise) |
| <b>CAPACITY OF VESSEL (L)</b>              | Supplier to Advise  | <b>VOLUME OF FLUID (L)</b>   | Supplier to advise      |
| <b>PRESSURE (kPa(g))</b>                   |   | <b>TEMPERATURE (°C)</b>  |                         |
| DESIGN                                     | 49  | DESIGN   | 117                     |
| TEST (Hydraulic)                           | 73.5  | TEST   | 152.1                   |
| <b>DESIGN CODE</b>                         | SANS 9001, SANS 347, (preferred pressure vessel code ASME)  |  |                         |
| <b>SPECIFICATION</b>                       | N/A   |  |                         |
| <b>MATERIAL OF CONSTRUCTION</b>            | Stainless Steel   |  |                         |
| <b>REFERENCES &amp; Notes</b>              | [1] ENS-OWPVR-PID-24004 – Piping and Instrumentation Diagram (P&ID) for the Primary Solids Capturing System of the WOPG Demonstration.<br>NOTES:<br>XX = Supplier to advise |  |                         |

|                 |                         |                  |                            |
|-----------------|-------------------------|------------------|----------------------------|
| <b>SHELL</b>    | <b>FLANGES</b>          | <b>Cone</b>      | <b>PIPE NOZZLES</b>        |
| Stainless Steel | SS, ASTM A182-F304/304L | Stainless Steel  | Stainless Steel            |
| <b>SUPPORTS</b> | <b>GASKETS</b>          | <b>UTILITIES</b> | <b>PIPE NOZZLES LENGTH</b> |
| Strut Frame     | Supplier to advise      | N/A              | Supplier to advise         |

| NOZZLE SCHEDULE (Process piping connection, subject to change as per suppliers advice) |    |  |  |
|--|----|--|--|
| MARK   | NB | RATING AND FACING                          | DESCRIPTION  |
| <b>N1</b>  | 40 | Slip on flange (ASME B16.5 Class 150# RF)  | A 40mm flange welded on cyclone nozzle. Inlet for flow stream 24.      |
| <b>N2</b>  | 40 | Slip on flange (ASME B16.5 Class 150# RF)  | A 40mm flange welded on cyclone nozzle. Outlet for flow stream 35.     |
| <b>N3</b>  | XX | Slip on flange (ASME B16.5 Class 150# RF)  | A XXmm flange welded on cyclone nozzle. Outlet for flow stream 36.     |
| <b>N4</b>  | 15 | Slip on flange (ASME B16.5 Class 150# RF)  | A 15mm flange welded on cyclone nozzle. Outlet for pressure indicator. |
| <b>F4</b>  | 15 | Threaded flange (ASME B16.5 Class 150# RF) | A 15mm threaded flange fitted on cyclone flange. Pressure gauge port.  |

| DIMENSIONS                      |       |   |
|---------------------------------|-------|---|
| PARAMETERS                      | UNITS | DESCRIPTION                                     |
| EFFICIENCY                      | %     | 90 (Minimum)                                    |
| DIAMETER (A)                    | mm    | Not greater than 375 mm, (Supplier to advise)   |
| CONE HEIGHT (B)                 | mm    | Supplier to advise                              |
| OVERALL HEIGHT (C)              | mm    | Overall height of 2000 mm (supplier to advise). |
| INLET HEIGHT (D)                | mm    | Supplier to advise                              |
| DIAMETER OF VORTEX FINDER (E)   | mm    | Supplier to advise                              |
| OUTER DIAMETER – SOLID SIDE (F) | mm    | Supplier to advise                              |
| INLET VELOCITY                  | m/s   | Supplier to advise                              |
| DISCHARGE VELOCITY              | m/s   | Supplier to advise                              |

|              |            |  |
|--------------|------------|--|
| <b>OTHER</b> | Name Plate | Indicate Name plate with company name, operating and design parameters, materials of construction. Nozzle schedule |
|--------------|------------|--|

| NON DESTRUCTIVE TESTING (NDT) |     | FABRICATION  |     |
|-------------------------------|-----|--|-----|
| DYE-PENETRANT (100%)          | Yes | CHEMICAL CLEANING (O <sub>2</sub> Service) (Last Fabrication step) | Yes |
| LEAK TEST                     | Yes | HEAT TREATMENT   | N/A |
| MAGNETIC PARTICLE TESTING     | N/A | HELIUM LEAK TESTING  | N/A |
| ULTRA-SONIC (100%)            | YES | ALLOWABLE LEAK RATE  | N/A |
| HARDNESS TESTING              | YES | SURFACE FINISH INTERNAL  | Yes |
| X-RAY                         | N/A | MATERIAL CERTIFICATES  | Yes |
| QUALITY CONTROL BLOCK         | N/A | VESSEL TO BE DRIED   | Yes |

| APPROVAL |                      |             |           |      |
|----------|----------------------|-------------|-----------|------|
|          | DISCIPLINE           | NAME        | SIGNATURE | DATE |
| Prepared | Mechanical Engineer  | M Nteo      |           |      |
| Reviewed | Mechanical Engineer  | M Mokgohloa |           |      |
| Reviewed | Process Engineer     | N Manilal   |           |      |
| Reviewed | Process Engineer     | W Ludwick   |           |      |
| Reviewed | Chief C&I. Engineer  | G Manuel    |           |      |
| Reviewed | Chief Elec. Engineer | W van Berg  |           |      |
| Reviewed | Chief Chem. Engineer | K Moodley   |           |      |
| Approved | Chief Mech. Engineer | S Mngoma    |           |      |

| REVISION HISTORY |              |            |          |
|------------------|--------------|------------|----------|
| Revision         | Description  | By         | Date     |
| 1.0              | First Issued | Makgetha N | 26-02-25 |
|                  |              |            |          |
|                  |              |            |          |

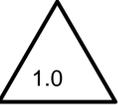


South African Nuclear Energy Corporation SOC Limited

Oil Waste Plasma Gasification Demonstration Facility

Cyclone Y1301 Specification Sheet

DESTROY ALL PREVIOUS PRINTS



1.0

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Revision