Storage and Transfer Systems

CO_2 Capture Facility

Kårstø, Norway

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Storage and Transfer Systems

1.0 INTRODUCTION

This document describes the storage of chemicals and consumables on the CCC Plant and the transport or transfer to point of use.

2.0 DISCUSSION

The CCC Plant requires the following chemicals and consumables;

a. Concentrated MEA

b. Caustic soda solution

c. Granulated activated carbon

d. Filter elements

e. Lubricating and seal oils

f. Laboratory testing chemicals and consumables

g. Mechanical, piping, electrical, instruments consumables (hardware)

These are expected to be stored and transported as follows;

a. Concentrated amine

Concentrated MEA will be delivered by road tanker. A storage vessel, Amine Storage Tank (MT-101), is provided and sized for 1.5 times the size of the tanker. At present the maximum size of a tanker load is envisaged to be 52000 liters requiring a storage vessel with 78m3 working volume. When full this, storage tank would provide approximately 3 weeks of normal plant consumption.

The concentrated MEA amine will be pumped from the tanker's pump through a hose and piping to the Amine Storage Tank. The concentrated MEA can be pumped directly into the process amine circulation or pressured to the Lean Amine Solvent Storage Tank and mixed with water to achieve the desired MEA concentration before pumping directly into the process amine circulation

The Amine Storage Tank will contain an inert (nitrogen) atmosphere to prevent oxygen degradation of the concentrated MEA.

b. Caustic soda solution

Caustic soda will be supplied as a 50%wt solution in water in tote tanks, with a typical content of 1672 kg. The caustic soda solution will only be consumed during reclaimer operation and it is envisaged that during reclaimer

operation the tote tank will be require changing every 12 to 24 hours. The tote tank change is performed using a forklift truck.

It will be necessary to maintain additional tote tanks in heated storage and a stock of 14 tote tanks providing for 1 week reclaimer operation is envisaged. The stock and in service tote tank shall be stored together close to the reclaimer facilities and provided with a containment bund.

c. Granulated activated carbon

Granulated activated carbon is required for the activated carbon filter, F-101.

Granulated activated carbon will be stored in bulk bags (or Super Sacks) under a shelter. Each filter vessel contains 18.9m3 and so allowing for 5% margin for filling, 20m3 is required for each. A stock holding of 2 filter changes or 40m3 is adequate for 2 weeks operation. Each bulk bag contains 1m3 of activated carbon and a covered area of 3m x 5m is provided.

d. Filter elements

Filter elements are inert (e.g. polypropylene) and will be stored in the general stores building and delivered to the filter by forklift truck when required for change. The largest filter assembly is anticipated to contain about 60 elements (each 150mm diameter x 1500mm length) with a 6 monthly change frequency. Sufficient elements for 2 changes should be maintained in stock.

e. Lubricating and seal oils

These shall be stored in a heated building located adjacent to the general stores building for distribution by forklift truck to the necessary equipment. These oils should be stored separately to other chemicals and consumables and provided with a containment bund.

f. Laboratory testing chemicals and consumables

The laboratory testing requirements should be relatively small and the facility laboratory should contain a secure chemical store cabinet for the necessary laboratory chemicals stock.

g. Mechanical, piping, electrical, instruments consumables (hardware)

These consumables will be stored in the general stores building and delivered by forklift truck where necessary.

3.0 CONCLUSION

For most consumables the storage requirements are modest. Due to the scale of the plant, and thus its consumption rate, the storage and logistical requirements for concentrated MEA and granulated activated carbon are large. These have been detailed above and are accommodated in the proposed design.