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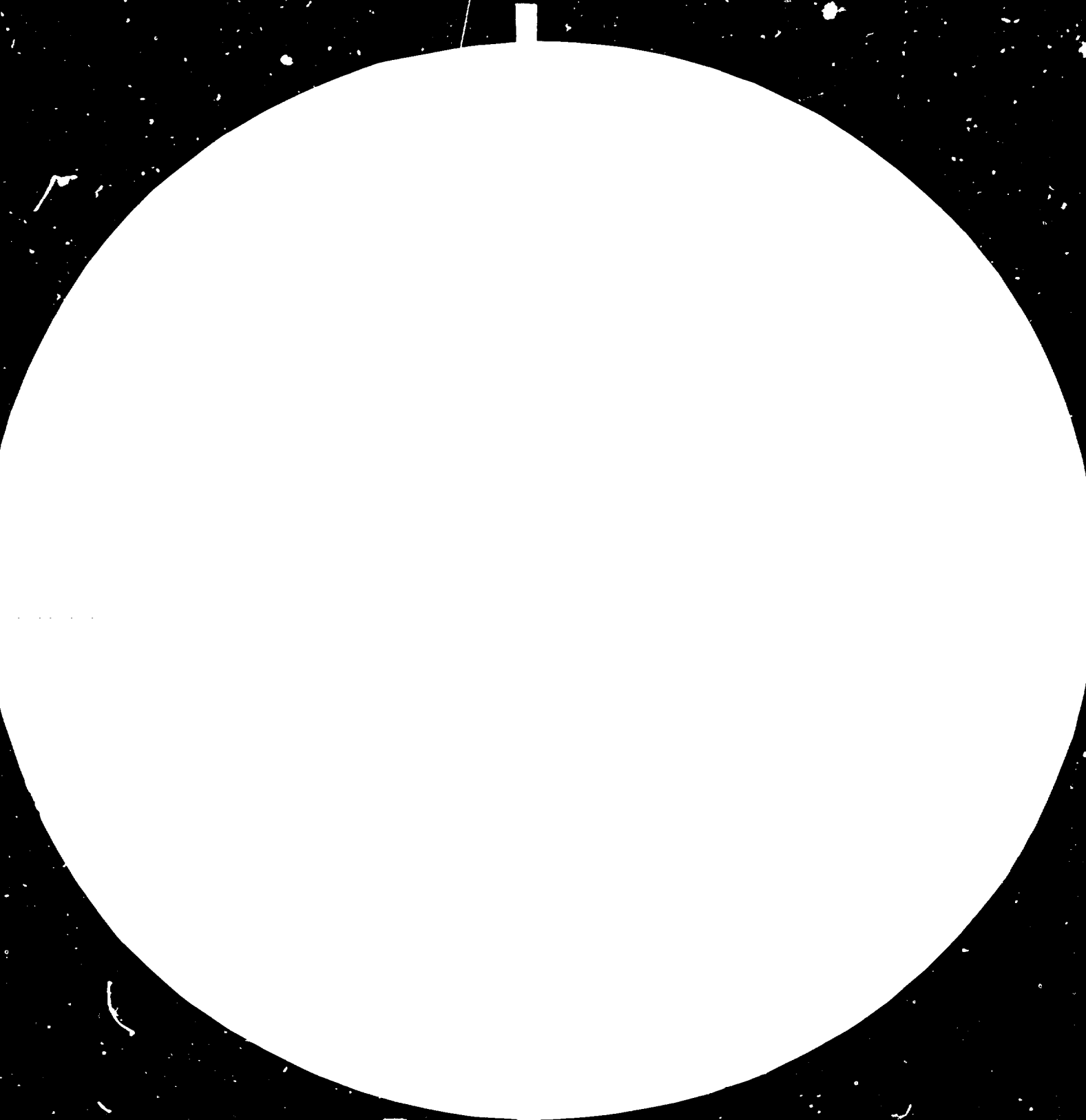

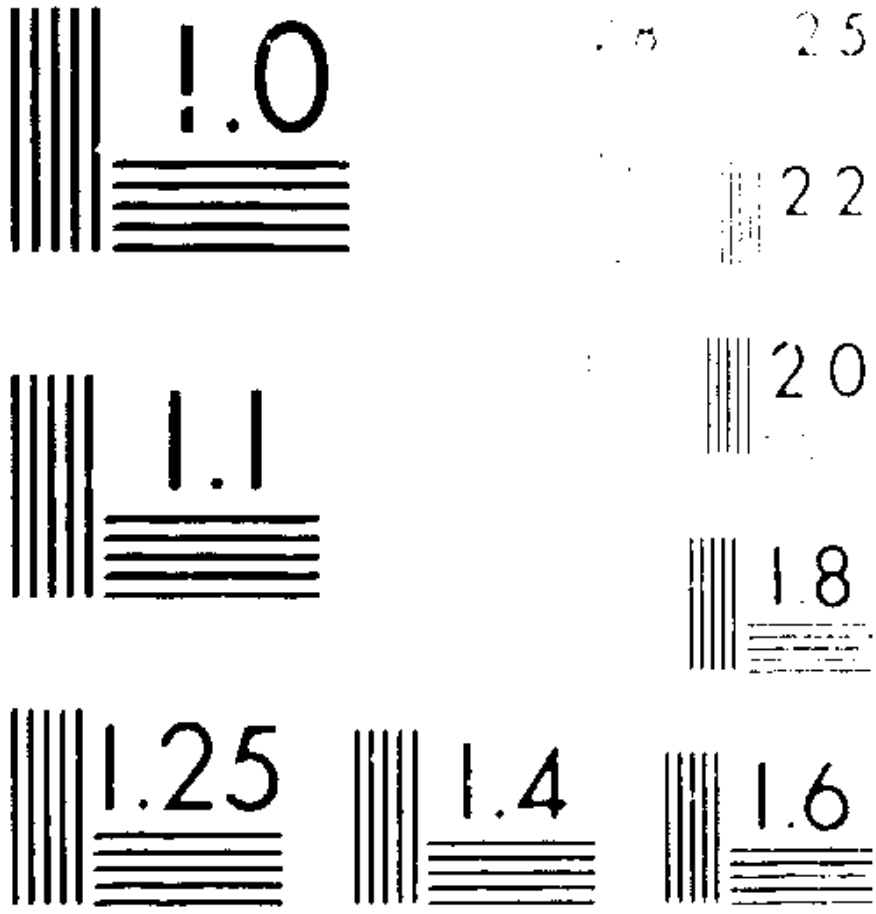
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A BRIEF HISTORY AND THE CURRENT STATUS OF AMMONIA BASED FERTILIZER INDUSTRY IN SRI LANKA*

by

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INTRODUCTION

The entry of Sri Lanka to the field of Ammonia production has been very recent. However, considerable quantities of Ammonia based fertilizers (over 250,000 MT in 1980) had been imported into the Country for a long period and such imports continue to the present day although on a much reduced scale.

Sri Lanka's is primarily an agricultural economy the main crops being tea, rubber, coconut and rice. Ammonium Sulphate and Urea were imported into the Country to meet the requirements of Nitrogenous Fertilizer for the above crops. Urea was at first used mainly for the cultivation of rice since it was found that long-term application of Ammonium Sulphate resulted in increased soil acidity.

The popularity of Ammonium Sulphate in the case of other crops continued until late seventies when Urea displaced it as the main source of Nitrogen.for rubber and coconut as well. Today in the case of rice, coconut and rubber, Urea is almost exclusively used as the source of Nitrogen. In the case of tea, Ammonium Sulphate is still widely used especially for young plants upto 3-4 years. The Sri Lanka government has helped to encourage the use of Urea by maintaining a price subsidy to the farmers for Urea at 65% of the ex-factory price.

Having briefly outlined the status with regard to the use of Ammonia based fertilizer in the Country, I shall now give the background to the infant Ammonia fertilizer industry in Sri Lanka.

ESTABLISHMENT OF A FERTILIZER INDUSTRY

In May 1966, the Sri Lanka Government established the State Fertilizer Manufacturing Corporation, a wholly owned government undertaking primarily to set up a modern Ammonia/Urea Fertilizer Complex based on Naphtha from the State Owned Petroleum Refinery, as feedstock. In 19 8 S.F.M.C. called for worldwide tenders for the construction of an Ammonia/Urea facility but due to a variety of reasons the plans had to be temperarily abandoned. These plans were later reviewed and a contract for the construction of the facilities was finally awarded in January 1976.

The contract called for the construction of a 540 MT/day Ammonia Plant, a 940 MT/day Urea Plant and associated offsites and utilities including steam and power generation and Urea bagging and despatch. The Contractor also had the responsibility to train local staff in the operation of the Plants. A site for the Complex was selected at Sapugaskande, 16 k.m.. from the capital city of Colombo, adjacent to the State Petroleum Refinery. The processes selected were the Kellogg (Naphtha reforming) Ammonia process and the Stamicarbon total recycle CO_2 stripping process for Urea.

PLANT CONSTRUCTION AND COMMISSIONING

The construction of the Plant was subject to various delays and mechanical completion was achieved only in August 1980. Unfortunately commissioning and start-up operations of the Plant too were subject to long delays due to a succession of failures of mechanical equipment and hence the performance guarantee tests could be completed by the Contractor only in September 1981.

Some of these cases of failure are briefly described here. One of the first problems encountered were with the three low pressure boiler feedwater pumps associated with the utility boilers operating at 40 kg/cm^2. These pumps failed due to left over material from shortblasting operations of the deaerator at the manufacturers works, passing through them. Although the boiler feedwater system had been thoroughly cleaned and inspected prior to charging, these debris had been present in inaccessible places of the deaerator bonded to the metal surfaces. Only later, when inspection windows were cut in these areas that the riddle was finally solved.

Another major problem was with the process air compressor intercoolers. It was discovered that the internals of the intercoolers were wrongly assembled at the manufacturers works. Replacement of all the internals had to be carried out.

We also experienced problems with the drive coupling between the Carbon Dioxide compressor driver turbine and its governor. Frequent failure of this coupling caused us very long and expensive delays in the start-up programme. This problem was traced to a misalignment caused by steam impingement on the turbine front bearing pedestal. The coupling too was however modified.

The most serious of the mechanical problems were associated with the fuel oil burners in the auxiliary boiler of the primary reformer furnace. These burners were found to be unsuited for the service. Failures of the bearings and the rotating arms of the burners became a very regular feature. After a number of attempts at improvement the burners were finally replaced with new burners in August 1981.

TRAINING OF PERSONNEL

From the commencement of construction activities training of craftsmen such as Welders, Fitters and Millwrights was undertaken by the Contractor at a training school set up at the site. It was largely due to this that construction and commissioning activities could be carried out using only local labour with expatriate supervision. For example over 200 Welders were turned out by the training school and all site welds except for a very few requiring special procedures were done by the above Welders.

Training programmes for Plant Engineers were conducted at the home offices of the Contractor and at an Ammonia and a Urea Plant abroad. In the case of Plant Operators several batches were trained at the above two Plants and the others were given classroom and inplant training locally. It has been possible for us to operate the Plants using entirely local staff at operator level with a degree of expatriate backup at Plant engineer level. This backup is presently provided by a team from Madras Fertilizers Limited, India who provide technical assistance for Plant operations and maintenance. It is planned to operate the Plant using entirely local personnel by mid 1983.

PLANT OPERATIONS

Since the takeover of the Plant from the Contractor, the performance of the Plant has been very satisfactory and during the first two months of this year we have achieved an average capacity utilization of over 90% producing 23,720 MT of Ammonia and 41,316 MT of Urea. All the Ammonia produced is converted to Urea except for a small inventory of around 700 MT kept in storage.

During the short period that we have been operating the Plant we have not been subject to serious constraints with regard to Plant operations. However, departure to skilled personnel to Middle Eastern countries is beginning to cause us concern. For example it was only last month that we lost ten Instrument Technicians within one week to the Middle East. We have attempted to minimise possible adverse effects of such incidents by maintaining 25% excess staff in critical areas where skilled personnel are not readily available locally.

CONCLUSION

The demand for Urea in the country is estimated to be around 150,000 MT this year and in addition it is planned to establish a buffer stock of 30,000 MT. Based on the above quantities it is felt that there would possibly be a relatively small quantity of Urea for export during the course of the year. The demand for Urea in the country is expected to increase to 327,000 MT during the decade.

Although the consumption of Urea in the country has not kept pace with the projections in the past, it is hoped that with the large new irrigation projects now under implementation and the complete changeover to Urea as the source of Nitrogenous Fertilizers for the large majority of crops in the near future, the total output from the Sapugaskande Urea Plant will be absorbed within the Country.