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PARADEEP



REVIVAL OF IFFCO PARADEEP

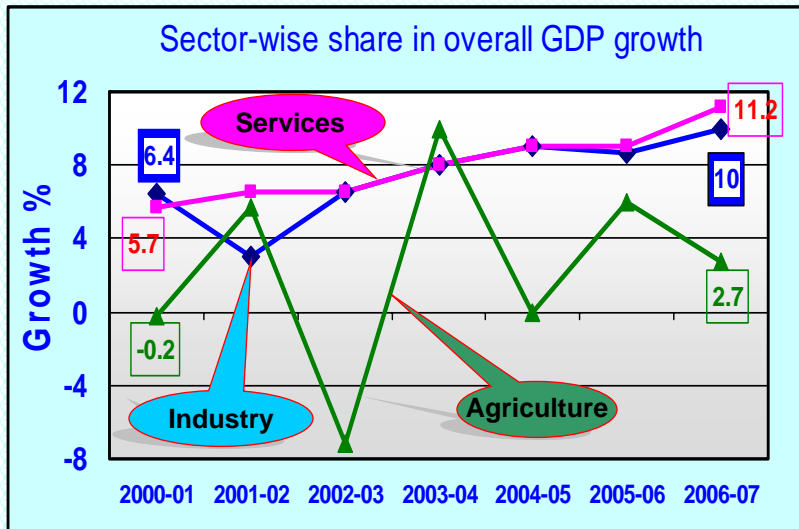
By

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Present Agricultural and Fertilizer Scenario of India

Declining trend in agricultural growth



Reasons for Declining Trend

- Shortage of indigenous production of Fertilizer
- Imbalance in nutrient application ratio
- Nutrient depletion rate more than application rate
- Lack of application of micro nutrients

Gap between Production and Consumption of P_2O_5

- In 2005-06, 5.2 million tonnes P_2O_5 was consumed while indigenous production was only 4.2 million tonnes.
- In 2006-07, P_2O_5 import was 1.2 million tonnes. No new green field Phosphatic plants or expansions are envisaged.
- Oswal's Paradeep Unit was idle till September 2005 due to environmental and other problems. IFFCO acquired the Paradeep Unit in October 2005.



Future Fertilizer Scenario

- Demand of P_2O_5 will be 6.7 million tonnes by 2009-10. This will necessitate more import.
- With the acquisition of IFFCO's Paradeep Unit, it will add 0.80 million tonnes of P_2O_5 which in turn will improve the availability of Phosphatic Fertilizer to Indian farmers.
- IFFCO has a proven track record of operating its plants at more than rated capacity.



Manufacturing Units of IFFCO



IFFCO Paradeep Unit



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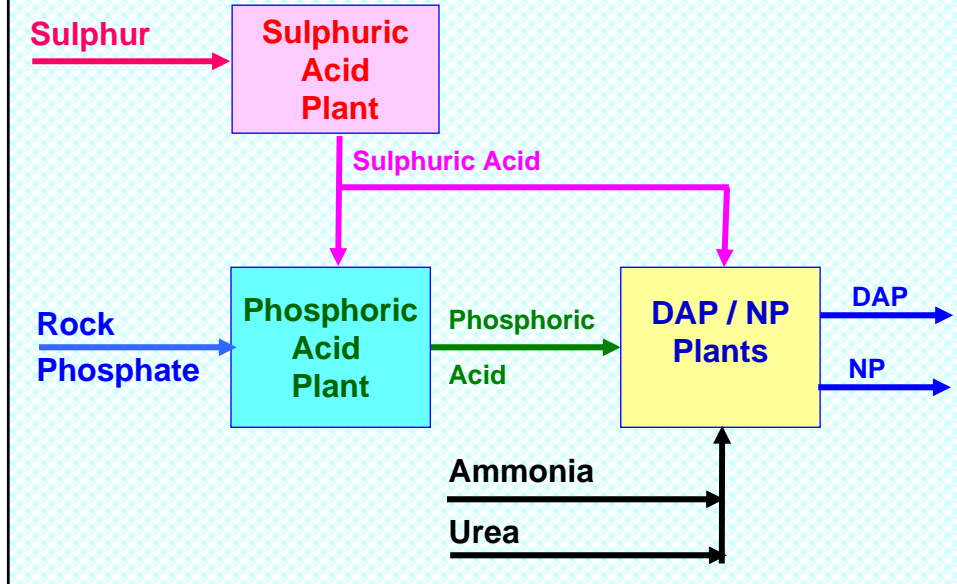
At a Glance



Year of Commissioning : 2000
Ownership of Plant upto 30.09.2005 : OCFL
Take over by IFFCO : 01-10-2005

Product	Capacity MTPD	Technology
Sulphuric Acid	2 x 3500	Lurgi GMBH, Germany
Phosphoric Acid	1 x 2650	Jacobs Engg., USA
DAP/NP	3 x 2090	Jacobs Engg., USA
Captive Power Plant	2 x 55 MWH	LMZ Energy, Russia
Annual Production	23.10 Lakhs MT Sulphuric Acid 8.75 Lakhs MT Phosphoric Acid 19.20 Lakhs MT of DAP/NP (Bulk)	

Process Diagram



Annual Requirement of Raw Materials

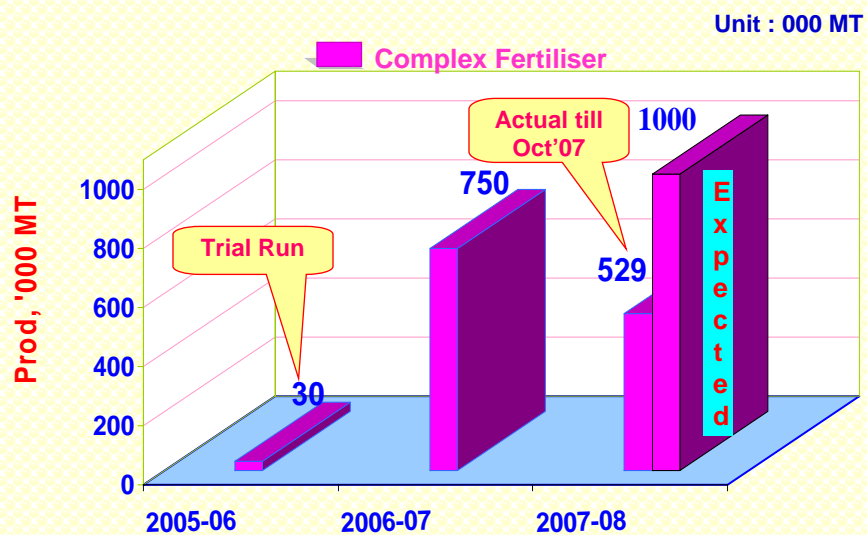


- ☒ Sulphur : 7.70 Lakh MT
- ☒ Rock Phosphate : 37.00 Lakh MT
- ☒ Ammonia : 4.40 Lakh MT
- ☒ Urea : 0.10 Lakh MT

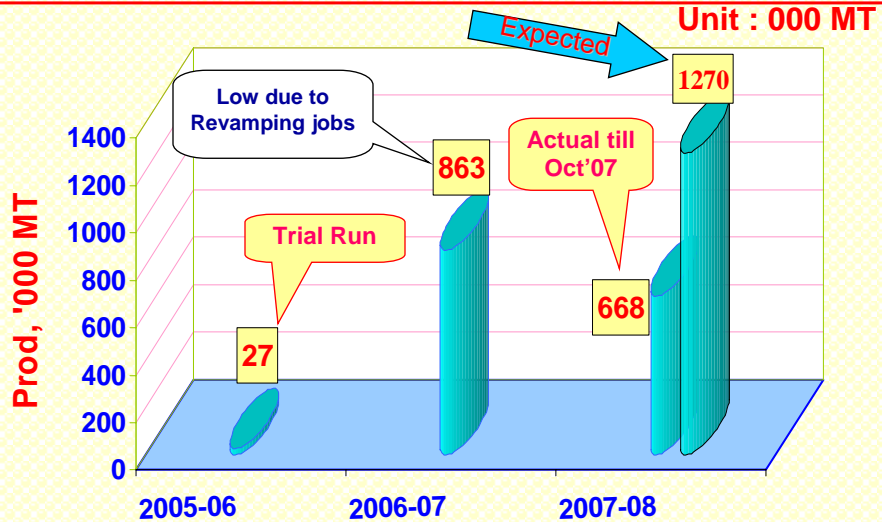
Production Performance



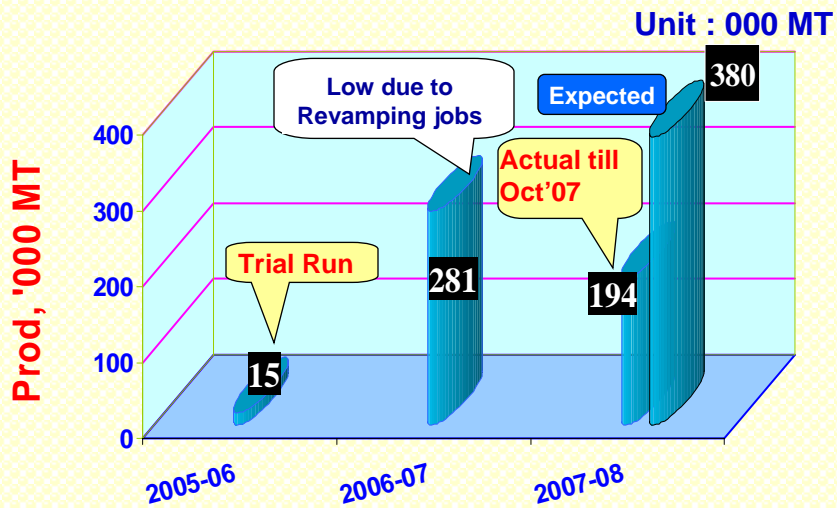
Production performance of Complex Fertiliser (DAP/NP) plant



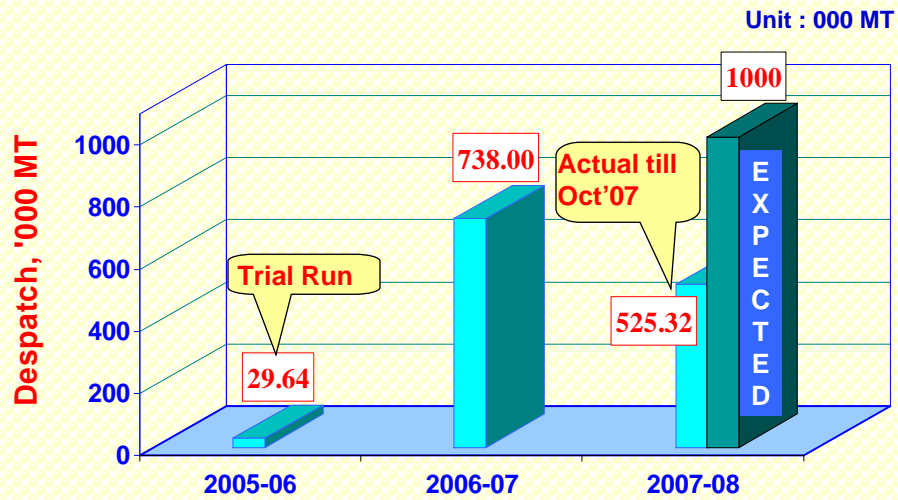
Production performance Sulphuric Acid plant



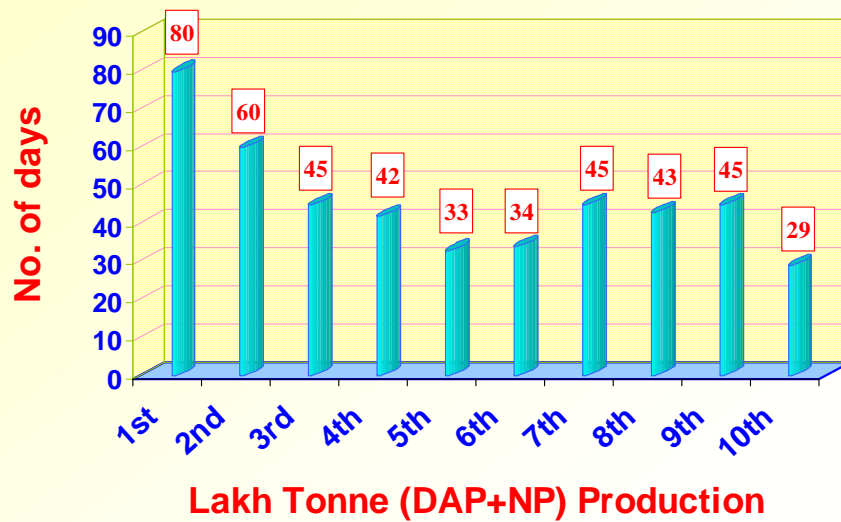
Production performance Phosphoric Acid plant



Despatch of Complex Fertiliser (DAP/NP)



Complex Fert. Production Trend



Strategies for Revival



Strategies for Revival

- ✦ **Outlining detailed revamp philosophy**
- ✦ **Compliance of Pollution Control Board conditions**
- ✦ **Engaging world renowned technical consultants**
- ✦ **Technical audit and Design check**
- ✦ **Trial run of plants**
- ✦ **Implementation of modifications**
- ✦ **Development of Infrastructure**
- ✦ **Improvement in safety standards**
- ✦ **Computerization & communications**
- ✦ **Good house keeping, construction of roads & drains and development of greenery**
- ✦ **Retaining of Manpower, training & cultural change**

MEASURES IMPLEMENTED



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Revamp Philosophy

- **Improving reliability of Equipment**
- **Compliance of Statutory Norms**
- **Create safe working condition**
- **Motivate people for Revival of the Plant**

Compliance of Pollution Control Board Conditions

- *HAZOP, EIA study & Health check up of the Plant*
- *Monitoring equipment for ambient air & Stack*
- *Revamp of sulphuric acid plant*
- *Ammonia detectors*
- *Raising embankment, lining & stone pitching of Gypsum pond*
- *Raising height of garland dyke & lining*
- *Creation of balancing pond*
- *Analyzer in AFBC boiler stack*
- *Fire hydrant & dust suppression system at Jetty*

Construction of Approach Roads

- ❖ *Road conditions were in bad shape in the whole complex.*
- ❖ *Plant was with pools of water bodies, sludge and foreign material resulting in poor access to various areas of plant and unsafe working conditions.*



Construction of Approach Roads



Approach Road between DAP Train B & C

Construction of Drains

- *All drains were in bad shape in the whole complex.*
- *Construction of storm water and effluent drains were undertaken in the complex.*



Steel Structure with Asbestos sheets

Complete plant is constructed on steel structure with AC sheets including storage silos, conveyor galleries, plant sheds, offices, MCC's etc.



Steel Structure with Asbestos sheets

The condition of AC sheets were so poor that majority of the sheets were required to be replaced with new AC/GI pre-coated sheets.



Sulphur Conveying System (SAP)



Sulphur Storage Shed

Painting

Painting of buildings, equipments, conveyor galleries and steel structures were in bad shape.



Trial Run of plants



- Since the plants were under shutdown for a long period, initially essential maintenance activities were carried out for trial run of all the plants.
- Despite various constraints, trial run of the plant was carried out from 17th Nov 2005 to 5th Jan 2006;
 - > to identify problems in various equipments.
 - > to study the operational constraints.
 - > to plan for major repairs / rehabilitation.
- Shut down for 3 months was planned to overhaul the equipments and machines.

Procurement of Spares & Equipments

- **No proper spares were available.**
- **Requirement of spares, equipments, pipes, pipe fittings, structures etc. was very large.**
- **Requirements were sought from other four units of IFFCO if available or procure material on behalf of Paradeep unit.**
- **Spares were also procured from OEM.**
- **Due to lack of critical / imported spares from OEM, alternate action was taken to procure similar spares from indigenous sources.**

Engagement of Good Contractors

To carryout revamp jobs reputed contractors from different parts of the country were engaged.



Major modifications implemented in Sulphuric Acid Plant

- **Revamping of Sulphuric Acid Plant Train-1 & 2**
- **Replacement of sulphur leaf filter**
- **Installation of air suction filter**
- **Replacement of converter catalyst**
- **Provision for preheating catalyst**
- **Provision for start-up steam line**
- **Replacement of candle filters in IAT and FAT**
- **Back flushing arrangement of acid coolers**
- **Acid draining and recovery system**
- **Condensate recovery system**
- **Utilization of back pressure steam from turbines**
- **Flooring of sulphur silo**



Plant View After Revamp



Major modifications implemented in Phosphoric Acid Plant

- Installation of rock phosphate dust suppression system during unloading
- Revamp of ball mills
- Brick lining in flash cooler
- Replacement of fumes scrubber duct alongwith spray nozzles
- New agitators to improve efficiency of Reactor
- Replacement of mixing Tee
- Revamping of belt filters
- Replacement of damaged pumps

Major modifications implemented in Phosphoric Acid Plant

- Revamping of evaporator heat exchangers.
- Brick lining in Flash chambers of Evaporators.
- Reduction in LP steam pressure to improve life of graphite heat exchangers.
- Revamp of cooling towers.
- Replacement of gypsum pump lube oil heat exchangers with higher heat transfer area.
- Gypsum pond management.

Plant View After Revamp



Major modifications implemented in DAP & Bagging Plant

- ▶ **Revamping of 10 nos. Phosphoric Acid storage tanks in DAP.**
- ▶ **Floor levels of DAP and Bagging plants was raised by 800 mm to approach the equipments for safe operation and maintenance.**
- ▶ **Replacement of Stitching Machines.**
- ▶ **Replacement of vibrating screen & granulator panels.**
- ▶ **Flooring of raw material storage shed.**

Electrical Distribution System and Instrumentation

To reduce the down time of plants, improvement of electrical distribution system and instrumentation was carried out.

- ☒ **Up-gradation of PLC and DCS system**
- ☒ **Installation of 2.5 MW DG set**
- ☒ **Installation of load management & control system**
- ☒ **Installation of capacitor banks for power factor improvement**
- ☒ **Lifting of all the transformers and MCCs by one meter to avoid tripping during rainy season**
- ☒ **Providing proper illumination in & around plant**

Measures Implemented in Other Areas

- **Repairing of Grab un-loader at Port**
- **Dust suppression system at Port**
- **Dust suppression system at rock phosphate silo**
- **Sulphuric Acid import facility**
- **Construction of Storm water drains, Effluent drains & culverts**
- **Construction of roads**
- **Green belt and horticulture works**

MEASURES UNDER IMPLEMENTATION



Measures Under Implementation

- ❖ **Construction of new molten sulphur storage tank**
- ❖ **Construction of additional Rock Phosphate storage silo (capacity : 1,00,000 MT)**
- ❖ **Revamping of the Fluorine Recovery system.**
- ❖ **Construction of new Phosphoric Acid Storage Tanks / Clarifiers (2 Nos.)**



Construction of new Phosphoric Acid Storage Tanks

Contd 

Measures Under Implementation

- ✧ **Facility for import of Phosphoric Acid**
- ✧ **Construction of Urea & Potash silo and handling system**
- ✧ **Construction of additional 10000 MT ammonia tank**
- ✧ **Shifting of coal handling plant**
- ✧ **Drinking water system**
- ✧ **Revamping of Fire Hydrant, Fire alarm, water sprinklers & smoke detection system**
- ✧ **Railway siding for the plant**

Environmental Improvement Measures



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Tank Bund Wall



Acid tanks bund wall provided and provision made to collect the tank over flow.

Water Conservation Schemes

- ❑ Use of treated effluent water in Ball Mills and lime preparation in place of process water. This has saved about 200 m³/h raw water.
- ❑ About 190 m³/h raw water saved with utilization of SAP cooling water for Gypsum Pump gear box oil cooling & Ball Mill lube oil cooling in place of process water.
- ❑ Total about 9360 m³ per day of raw water consumption has been reduced.

Use of treated effluent water



Top View of ETP Plant



Improvement in Insulation for energy saving

Before



After



Converter insulation

Improvement in Insulation for energy saving

Before



After



HP Steam line to TG

Inspection Facilities for quality maintenance

- **There was no concept of condition monitoring.**
- **All the required instruments and gadgets were purchased for establishing inspection facilities.**
- **This improved operational reliability of the plant.**

Inspection Facilities for quality maintenance

Various inspection activities :

- *Dynamic balancing of Rotary component*
- *Use of alloy analyzer for identification of material quality before use.*
- *Thickness measurement of pipelines and vessels.*
- *DP test & Radiography of weld joints.*
- *Spark testing of rubber lined pipelines and vessels.*
- *Vibration measurement of Rotary Equipments.*



Strengthening of workshop



Workshop facilities

Workshop facilities were upgraded to carry out various precision jobs in-house to reduce dependency on outside source and to save time for repair & maintenance.



Improvement in other areas



Arrangement of Raw Materials

- ◆ *Various suppliers were contacted for supply of quality raw material on long term basis.*
- ◆ *Facility created for import of sulphuric acid.*

Revamp of Port Handling System



Port handling facilities & conveying system were revamped to handle huge volume of raw materials.

Movement of Fertilizer Product

- ◆ Facilities created at Rangiagarh siding near Paradeep Railway Station with the help of Paradeep Port & Railway Authorities for rake loading.
- ◆ For transferring fertiliser product from plant site to rake loading site, a dedicated fleet of covered trucks were commissioned.
- ◆ Reputed consultants were engaged to study Rail loading facility within the plant premises.

Improvement in Safety Standard

To improve safety, various measures implemented are as under.

- Implementation of Safety Philosophy and commitment spelt out in our Safety, Health & Environment Policy.
- Employees were educated to realize that Safety, Health and Environment Control is the responsibility of all.
- Training to all employees were given in Safety, Health & Environment Management.
- Central and Departmental Safety Committees were formed.

Improvement in Safety Standard

- Fire Protection equipments and fire tenders procured.
- Safety Work Permit system has been implemented.
- Electrical Tagging Procedure started.
- Employees were encouraged to use personal protective equipments.
- In all the belt conveyor systems pull cords were commissioned.



Local / Wide Area Network (LAN / WAN) installed and VSAT communication system commissioned.



-  **Complete wireless network connectivity introduced for the first time in IFFCO at Paradeep.**
-  **Finance & Accounting System, Materials Management System, HRMS and Product Despatch System implemented.**
-  **Integrated ONLINE Coal, Raw Materials, Bagging, Product Handling and Chemicals Accounting software implemented.**
-  **Multimedia Projector, Video Conferencing, VoIP communication implemented.**



Culture Change and Training

Bring cultural change to IFFCO standard

- Major challenge was to inculcate the culture of IFFCO among the employees absorbed from previous management.
- Dedicated and highly experienced personnel from various disciplines from other units of IFFCO were deputed to train, assist and guide the employees.

Training for plant operation and maintenance

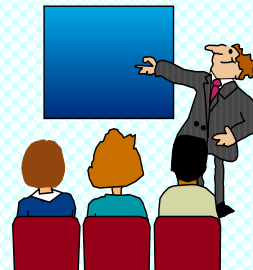
- To upgrade the knowledge in operation and maintenance, assistance were taken from various experts.

Training Activities



To improve productivity, various in-house training programmes were conducted and stress was given on the following :

- o General awareness of plant operation
- o Cost reduction strategy
- o Energy conservation.
- o Computer application.
- o Safety & environment.
- o Workers' development
- o Materials management.



House Keeping



House Keeping



Approach Road SAP Plant



IFFCO PARADEEP TOWARDS GREENERY





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Employees Suggestion Scheme

- ❖ The scheme is aimed at motivating employees to come out with creative suggestions.
- ❖ Employees giving good suggestions are suitably awarded.



Dealing with Industrial Relation issues

There were many industrial relation issues at the time of takeover of the Phosphatic Fertilizer complex which were amicably resolved

Township



Township buildings were renovated.
Construction of new quarters started.

Administration Building under construction



Township Building under Construction

- ✧ *Construction of buildings for Administration, Guest House, Staff Quarters, School, Hospital etc*



Welfare Activities

- DAV School up to IVth standard started.
- Hospital & Dispensary commissioned.
- Purified Drinking Water System for Plant & Township commissioned.
- Bus facility from Township to Railway Station started.



Employees Health Care Programme

- ❖ Medical checkup of all employees started.
- ❖ Health awareness tips are displayed on notice boards of township & plant.
- ❖ Medical history and records of employees & their dependent members started in township dispensary.



