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अनंत कुमार
ANANTH KUMAR
ಅನಂತ ಕುಮಾರ್



रसायन एवं उर्वरक मंत्री
भारत सरकार
MINISTER FOR
CHEMICALS & FERTILIZERS
GOVERNMENT OF INDIA



MESSAGE

I am happy to learn that the Standing Conference of Public Enterprises (SCOPE) is bringing out a special issue of its monthly magazine 'KALEIDOSCOPE' focusing on Fertilizer Industry in the country. India that has majorly been an agrarian economy, the significant role played by fertilizer is well recognized and established.

Our country is the 3rd largest producer and 2nd largest consumer of fertilizers in the world. Making fertilizer available to the farmers at affordable prices has been an integral part of our policy. The Government has been making efforts for attaining self reliance in fertilizers. The New Urea Policy 2015 is a step towards the same. The Policy aims at maximizing indigenous urea production, promoting energy efficiency and reducing dependence on imports.

The Government has already taken several steps in giving a boost to investment in the fertilizer sector. Establishment of new fertilizer units and reviving the defunct ones by installing new modern machinery are also given top priority. The usage of Neem coated urea and Gas pooling policy are important initiatives for ensuring sustained growth in the agriculture sector.

I compliment SCOPE for its initiatives and wish the Special Issue all success.


(Ananth Kumar)

July, 2015

हंसराज गंगाराम अहिर
HANSRAJ GANGARAM AHIR



राज्य मंत्री
रासायन और उर्वरक
संबंधी विभाग
नई दिल्ली - 110001
Minister of State
Chemicals & Fertilizers
Government of India
New Delhi - 110001



MESSAGE

I am happy to learn that Standing Conference of Public Enterprises (SCOPE) is bringing out a special Issue of its monthly journal **KALEIDOSCOPE** on "Fertilizer Industry – Driving Agriculture Economy".

A nation's economic and social wellbeing can be judged from various parameters, Key being its food sufficiency. Fertilizers play a key role in meeting the objectives of self-sufficiency in food production and higher agricultural growth in the country. There has been substantial increase in production and consumption of fertilizer over the years. However, imbalance in fertilizer use remains the major cause of concern.

The government has taken credible actions to promote balanced use of fertilizers not only to keep the soil healthy, but also for increasing the agricultural production. New urea policy, Revival of sick PSEs, Uniform Gas Pricing for all, use of Neem Coated Urea, are among the major pronouncement on fertilizer reforms. With the steps being taken in the right direction, the way forward for the sector looks bright.

I compliment SCOPE for this endeavour and hope this Special Issue on Fertilizer would be of immense use to all those who are associated with the Fertilizer Sector.



(Hansraj Gangaram Ahir)

अमेरिङ लुखाम
अध्या
AMEISING LUKHAM
SECRETARY



भारत सरकार
जनता के विकास
भारत सरकार का जनता के विकास
Government of India
Department of Public Enterprises
Ministry of Heavy Industries & Public Enterprises



MESSAGE

I am happy to learn that Standing Conference of Public Enterprises (SCOPE) is bringing out a Special Issue of its monthly magazine 'KALEIDOSCOPE' focusing on the Fertilizer Industry. It is a welcome step at a time when the government is making significant strides in formulating a roadmap for the sector.

Fertilizers have been vital for the growth of the agriculture sector that accounts for about one seventh of the GDP and provides sustenance to nearly two third of the country's population. Over the last few years, the government has taken measures to increase the competitiveness of fertilizer industry which include the new Urea Policy, Gas Pooling, Neem coated Urea and Revival of Sick Units in the country. Steps are also being taken to make the sector digitally equipped.

Public Sector Enterprises in the sector need to continuously innovate themselves to make India self-sufficient in fertilizer and to reduce imports.

I compliment the efforts of SCOPE and extend my best wishes in their endeavour.

(Ameshing Lukham)

अनु कुमार बिशुद
ANU KUMAR BISINOD
सचिव
SECRETARY
फोन : 2326000
फैक्स : 2326000
ई-मेल : anubis@fertilisers.gov.in



अनु कुमर
अनु कुमर बिशुद
सचिव
अनु कुमर, अ. बिशुद कुमर
अ. बिशुद कुमर
GOVERNMENT OF INDIA
MINISTRY OF CHEMICALS & FERTILIZERS
DEPARTMENT OF FERTILIZERS
शांति भवन,
एन. राजेंद्रा प्रसाद रोड,
नई दिल्ली-110 002
<http://www.fert.gov.in>

MESSAGE

It gives me immense pleasure to know that Standing Conference of Public Enterprises (SCOPE) is bringing out a Special Issue of its monthly journal **KALEIDOSCOPE** on Fertilizer Industry.

Fertilizers play a key role in an agrarian economy like India to attain self sufficiency in food production. Shrinking land resources in the country have increased the number of crop cycles which reduces the productivity of the soil. Correct usage of fertilizers can ensure replenishment of soil fertility, making it possible to produce more crops.

The Government has taken several major initiatives to facilitate the industry to overcome the challenges faced by it. These include the Kisan centric – New Investment Policy, Clarity on Gas Pricing in the Country, Revival of Sick Fertilizer Plants and Introduction of Neem Coated Urea. These steps indicate the importance given to a sector that has a pivotal role to play in enhancing the economic growth of the country. This special issue of **KALEIDOSCOPE** is a testimony of SCOPE's commitment towards growth and competitiveness of Fertilizer Sector.

I wish SCOPE all success in its endeavours.

(ANU KUMAR BISINOD)
Secretary (Fertilizers)

September 23, 2015

CHAIRMAN'S DESK



Over the past six decades, the fertilizer industry in India has been playing a crucial role in shaping the destiny of one of the country's primary sectors i.e. agriculture. The agriculture sector contributes around 15.8 percent to national GDP (2013-14) and despite rapid industrialization, it remains a dominant sector in the economy, as more than 55 percent of India's workforce is dependent on it for their livelihood. If the country has to sustain its growth momentum, agriculture too has to grow at a healthy rate. The need of the hour is to boost agricultural productivity, in a sustainable manner, by overcoming constraints of cultivable land availability, water and other natural resources. To enhance agricultural productivity, so as to ensure food security for India's burgeoning population, the agriculture sector relies heavily on the fertilizer industry.

India is, today, one of the top three producers and consumers of fertilizers in the world. It is the second biggest consumer of fertilizers after China. In 2013-14, the consumption of nutrients in the country was around 16.8 million tonnes of N, 5.6 million tonnes of P and 2.1 million tonnes of K. For its urea requirements, the country is partially – to the extent of 25 percent – dependent upon imports. Import dependence for phosphatic fertilizers, including raw materials, is more than 90 percent, while for potash it is 100 percent, due to the lack of commercially exploitable natural resources in the country.

With an installed capacity of 13.5 million tonnes of nitrogen and 6.7 million tonnes of phosphatic nutrient, at its various fertilizer manufacturing units, India is now the third largest producer of fertilizers in the world. In 2013-14, the production of fertilizers – in nutrient terms – was 12.4 million tonnes of nitrogen and 3.9 million tonnes of phosphates.

Public Sector Enterprises (PSEs) are an intrinsic part of India's fertilizer industry, with a share of 28.4 percent of the total installed capacity for nitrogen in the country. The market share of PSEs, in the fertilizer sector, is a little over 20 percent and turnover for the financial year 2013-14 was Rs. 20,050 crore.

India has surely come a long way in terms of food grain production. From a modest 52 million tonnes in 1951-52, the food grain production increased to about 264.7 million tonnes in 2013-14. Despite this leap, which was fuelled by the famous Indian 'green revolution', the country has not fared well in terms of agricultural yields or productivity. The compulsion to provide for an ever increasing population – keeping the decreasing per capita land availability in view – will continue to put pressure on the limited land resource. Increased fertilizer use has not resulted in proportionate increase in food grain production. Another area of concern is that the nutrient use ratio is getting skewed, primarily due to the price disparity between urea and P&K fertilizers. The imbalanced use of nutrients, therefore, leads to deterioration of soil health. The major challenge before the agricultural sector is maximizing productivity in a sustainable manner. This is also the fertilizer industry's foremost concern.

The Fertilizer Industry is also faced with other challenges such as gas availability, high cost of production, the issue of fertilizer subsidies, demand-production gap, revival of sick units, etc. These issues need to be addressed urgently for further growth of the industry.

Despite its huge fertilizer production capacities, the country relies heavily on imports for its raw materials, intermediaries and feedstock requirements. For more than a decade there has been no addition in capacity in the sector. However, with the Government of India's 'new fertilizer policy', it

is expected that the sector will soon see some fresh investments, resulting in additional production capacity for urea. The new policy has laid down a road map for the future and has also mandated the setting up of a gas-pooling mechanism to streamline gas supplies for the fertilizer industry. Also under it, the government has sought to encourage conservation of energy through energy efficient technologies and to reduce environmental impact, through incentive schemes.

Improving energy efficiency of fertilizer plants is the need of the hour. I am optimistic that with new policies, this aspect will also be tackled efficiently. With industrial reforms being given high priority, revival of sick fertilizer units, it is hoped, will also see the light of day.

Taking into consideration the significant role that the fertilizer industry plays, SCOPE is bringing out this 'Special Issue' on the 'Indian Fertilizer Industry'. It will focus on macro policy issues, environmental issues and issues of pricing. Opportunities and challenges for the fertilizer sector in various areas, including constraints in availability of cheap and clean feedstock, creation of infrastructure and land requirement aspects will also be dealt with in this issue.

SCOPE has always worked for the betterment and benefit of PSEs. The fertilizer industry, being an important component of the same, is a prime focus area of SCOPE's activities. I hope this 'Special Issue' from SCOPE will help showcase the achievements of the fertilizer industry, and will also highlight its various concerns, so that steps can be taken to facilitate its next big leap forward.



(R. G. Rajan)
Chairman, SCOPE

Role & Contribution of Fertilizers in Maximising Agriculture Production



Siraj Hussain, IAS

Secretary (AC & FW),
Ministry of Agriculture &
Farmers Welfare

Role of chemical fertilizers in food grains production

Chemical fertilizers, mainly nitrogenous, phosphatic and potassic have played a significant role in increasing agricultural productivity, helping in management of food and nutritional security concerns in the country. About 50 per cent increase in agricultural production in post Green Revolution era is attributed to the use of fertilizers alone. Indian Institute of Soil Science, Bhopal has compiled soil test data of 500 districts on available N, P&K status from different locations in various States. Out of 500 districts, 465 districts (93 per cent) were deficient in available nitrogen, 457 districts (91 per cent) were deficient in available phosphorous and 259 districts (52 per cent) were deficient in available Potassium.

The sulphur deficiencies showing up in several parts of the country and are to the extent of 46 per cent. The States most deficient in sulphur are Himachal Pradesh, Kerala, Rajasthan, Andhra Pradesh and Jharkhand. The micro nutrient deficiencies are to the tune of 49 per cent Zinc, 33 per cent Boron, 13 per cent Molybdenum, 12 per cent Iron, 5 per cent Magnesium and 3 per cent Copper at the country

level. The Zinc deficiency is rampant in alluvial soils of Indo-Gangetic plains and black soils of Deccan Plateau. Boron deficiency is widespread in Odisha, West Bengal and Bihar. The iron deficiency has been noticed in rice on coarse textured soils of Punjab. Similarly, the deficiency of Magnesium is increasingly appearing on wheat grown after rice on coarse textured alkaline soils having low organic matter content. Copper deficiency is not a major problem for Indian soils and crops. Annual consumption of fertilizers in nutrient terms (N, P&K) has increased from 0.07 million tones in 1951-52 to 24.48 million tones in 2013-14. The Indian Council of Agricultural Research (ICAR) under its All India Coordinated Research Project (AICRP) on Long Term Fertilizer Experiments has demonstrated that integrated use of optimal doze of NPK and organic manure can correct micro and secondary nutrient deficiencies in soils to improve soil health arid crop productivity.

Effects when not used rationally

There is no scientific evidence of declining soil productivity of cultivable land from judicious use of chemical fertilizers. Imbalanced

use of fertilizers, low addition of organic matter and non replacement of depleted micro and secondary nutrients over the years, has resulted in nutrient deficiencies and decrease in soil fertility in some parts of the country, particularly in intensively cultivated Indo-Gangetic plains.

DAC's Strategy to promote balanced use of fertilizers

Government is implementing Soil Health Management under National Mission for Sustainable Agriculture. Soil Health Management aims at promoting Integrated Nutrient Management (INM) through judicious use of chemical fertilizers including secondary and micro nutrients in conjunction with organic manures and bio-fertilizers for improving soil health and its productivity; strengthening of soil testing facilities to provide soil test based recommendations to farmers for improving soil fertility; upgradation of Skill and knowledge of soil testing laboratory staff, extension staff and farmers through training and demonstrations.

As soil test based application of fertilizers is essential to improve soil health and productivity, the Government is promoting soil test

based balanced and judicious use of chemical fertilizers, bio-fertilizers and locally available organic manures like Farm Yard Manure, Compost, Vermi Compost and Green Manure to maintain soil health and its productivity.

In 2013-14, the soil analyzing

capacity in the country was 178.26 lakh soil samples per annum and 135.17 lakh samples analyzed. The soil testing facility is provided to the farmers free of cost or with some nominal fee by State Governments. Under the National Mission for Sustainable Agriculture, there is provision

to set up new static Soil Testing Laboratories (STLs) and new Mobile Soil Testing Laboratories besides strengthening of existing laboratories to enable them to undertake micronutrient testing. The year wise numbers of STLs sanctioned under this scheme are given in the table below:

S. No.	Component/ years	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	Total
1	New Static STLs	42	66	16	0	0	10	10	144
2	New Mobile STLs	44	62	10	2	0	5	69	192
3	Strengthening of existing STLs	39	107	9	15	1	2	7	180
	Total	125	235	35	15	1	17	86	516

STLs : Soil Testing Laboratories

Other components under this scheme are training and demonstration on balanced use of fertilizers, promotion of micronutrients and setting up/strengthening of Fertilizer Quality Control laboratories. Apart from the above, Soil Health Card (SHC) scheme has been taken up from 2014-15 with an outlay of Rs. 568.54 crore to provide Soil Health Card to all farmers in the country in 3 years period. It will enable farmers to apply appropriate recommended dosage of nutrients for crop production. Uniform norms will be followed for sampling, in irrigated area samples will be taken in 2.5 ha grid and in rain fed area in 10 ha grid. In all 2.53 crore samples will be tested and 14 crore soil health cards generated. During current year 84 lakh samples will be collected and tested against which so far 38 lakh samples have been collected by States.

Paramparagat Krishi Vikas Yojana

Government is committed to give thrust to promotion of Organic Farming across the

country. Presently, it is being implemented through the various programmes viz. National Mission for Sustainable Agriculture (NMSA), mission for Integrated Development of Horticulture (MIDH), Rashtriya Krishi Vikas Yojna (RKVY) and Network Project on Organic Farming under ICAR. With a view to realign various components related to Certified Organic Farming in a coordinated manner, "Paramparagat Krishi Vikas Yojana (PKVY)" has been launched to be implemented in a cluster mode. The main objective of the programme is to develop sustainable eco-friendly modal of chemical residue free agricultural production and to ensure coverage of more area under certified organic farming for increase in organic agriculture produce for the market. It is targeted to bring 5 lakh acres under organic certified area within a period of 3 years. Organic Farming is being promoted under the Soil Health Management (SHM) component of National Mission on Sustainable Agriculture (NMSA) which includes adoption of

organic farming through cluster approach under Participatory Guarantee System (PGS) certification and organic village adoption for manure management and biological nitrogen harvesting, besides assistance for creating facilities of production of organic manure/bio-fertilizer/bio pesticides.

Now, this programme will be implemented as per existing cost norms of duly approved 12th Plan Scheme of National Mission on Sustainable Agriculture (NMSA) in ratio of 50:50 with State Governments. In 2015-16, an amount of Rs.300 crores is allocated for this cluster programme.

It is targeted to cover ten thousand clusters (about 50 farmers in each cluster) in three years. Thus individual farmer will get financial assistance of Rs. 20,000 per acre for adoption of organic farming as input cost including packaging, branding, storage and transportation. Besides, financial support will also be provided to each cluster for PGS certification, quality control of organic produce, market development and training & demonstration. ■ ■ ■

Indian Fertilizer Industry:

The Challenges Ahead



R. G. Rajan

CMD, Rashtriya Chemicals & Fertilizers Ltd

Agriculture & Fertilizers- the larger picture

At the time of independence, the Indian economy was not in a healthy condition and the country's immediate necessity in the first two decades of those formative years was to provide food to its teeming millions. For self-reliant growth, the country adopted a structured economic planning approach and agriculture was the priority on the planning agenda of the government under the vision of "Wipe every tear from every eye". To bring about an agrarian revolution for achieving self-sufficiency in food grains, easy access to fertilizers - besides better farming practices and better variety of seeds - became imperative, thus paving the way for rapid growth of the Indian fertilizer industry, that fuelled the green revolution in the country. Over the last six decades, the fertilizer industry has played a pivotal role in achieving the national goal of becoming self-reliant in food grain production.

With the growth in population and increase in per capita income, the demand for food grains will continue to increase in coming years. As per estimates, our

population may cross even that of China by 2030. The compulsion to produce more from decreasing per capita land availability will continue to put pressure on the limited land resource. The average growth rate of the agriculture sector in India during Tenth and Eleventh Five Year Plan were 2.4 percent and 3.3 percent respectively. As per last year's Economic Survey, the share of agriculture and allied sectors declined to 13.9 percent of India's GDP. But the sector still accounts for around 55 percent of the total employment in the country. This underlines the need for a much higher growth rate in agriculture. The challenge is to maximize productivity by adopting a more sustainable agricultural strategy.

Indian fertilizer industry

The Indian fertilizer industry made a very humble beginning in 1906, when the first manufacturing unit of Single Super Phosphate (SSP) was set up in Ranipet near Chennai with an annual capacity of 6000 Tones. The Fertilizers & Chemicals Travancore of India Ltd. (FACT) at Cochin in Kerala and the Fertilizer Corporation of India (FCI) in Sindri in Bihar

(now Jharkhand) were the first large-sized fertilizer plants set up in the 'forties and fifties', with a view to establishing an industrial base to achieve self-sufficiency in food grains.

Subsequently, the 'Green Revolution' in the late sixties gave an impetus to the growth of fertilizer industry in India. Affordability and availability of fertilizers were the two drivers of increased consumption. To this end, the Government of India formulated a number of policies, in the past few decades - over various Five Year Plans' - to try and achieve the dual objectives, that of (1) Maintaining fertilizer prices at an affordable level for farmers, and (2) Facilitating growth of the domestic industry by assurance of a reasonable return on investment.

The real big thrust was received with discovery of gas in Bombay High and the consequent setting up of large capacity single stream ammonia-urea plants, in 'eighties and early nineties', along the HBJ pipeline. However, thereafter, there has not been any substantive addition to fertilizer production capacity, mainly on account of policies, not conducive to the growth of the industry and also

the lack of assured supply of domestic gas.

For the primary plant nutrients i.e., nitrogen (N), phosphate (P_2O_5) and potash (K_2O), India is dependent on imports to the extent of 40 percent in Nitrogen, while it is 93 percent in Phosphates and a 100 percent in Potash.

At present, there are 30 operating plants producing urea, 19 plants producing complexes/DAP and 107 Single Super Phosphate plants in the country. The annual sales of fertilizers is over 550 lakh MTs, of which about 140 lakh MTs is imported (as finished goods), the balance being indigenously produced. India is the second largest consumer (after China) and the third largest producer (after USA and China) of fertilizers in the world.

Technology Perspectives

Technologically, production of ammonia posed the greatest challenge - a challenge to synthesise ammonia from nitrogen

in the air and hydrogen from water. Commercial production of Ammonia has come a long way since its first production in Germany in 1913. Plants those days produced 25-30 tons a day - primarily for the purpose of manufacturing explosives during World War I. Large sized plants, today, produce 3000 tons per day. All through these technological developments, the aim was for capital optimization, improving reliability and bringing down energy consumption.

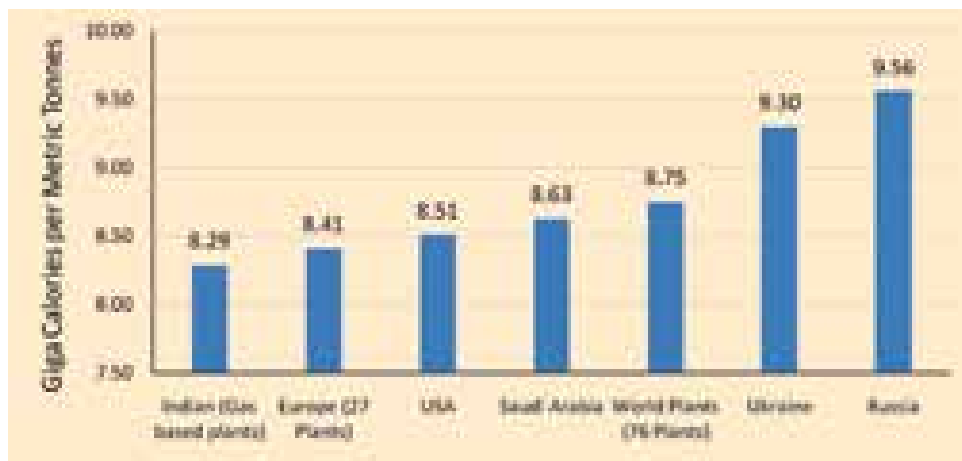
Though India started a bit late in the fertilizer arena, it has not lagged behind in adopting technological advancements. India's gas based ammonia plants are highly energy efficient (Fig 1), thanks to government policy impetus on energy efficiency and the ever increasing energy costs in India. Energy consumption levels of fertilizer plants have further come down from 8.29 GCal/MT in 2010-11 to around 8.1 GCal/MT last year. Of course, there is scope for further reducing energy consumption in these plants.

Push for Joint Ventures abroad

An endemic shortage of domestic gas in the country has pushed many fertilizer manufacturers to explore the possibility of setting up fertilizer production facilities abroad, where raw material is available in abundance. One such successful venture is gas-based ammonia-urea plant in Oman, with KRIBHCO, IFFCO and Oman Oil Company as joint venture partners. The entire urea production of about two million metric tons per annum, from this joint venture, is brought back into India at a very attractive price, to bridge the demand supply gap. Many of such, similar initiatives are being prospected by Indian companies in gas rich countries such as Iran and Turkmenistan.

Apart from gas, the other main raw materials for fertilizer are rock phosphate and potash. Indian companies are also on the lookout for opportunities to set up joint venture projects abroad, of phosphate and potash assets as well as finished phosphatic fertilizers. Efforts are also being made by industry members to enter into long term off-take agreements for potash with suppliers from Europe and Canada.

Fig.1 Energy Efficiency of Ammonia Plants 2010-11



Source: *FAI and Nitrogen + Syngas*, Vol. 325 September-October 2013

Subsidies & challenges in disbursement

On the flip-side of ensuring ample availability of fertilizers at regulated prices - that are below costs of production/import - is an ever increasing subsidy burden on the exchequer.

As per the Rangarajan Committee report released in July 2014, three out of 10 people in India, live below the poverty line. So subsidies in some form or the other are inevitable. The real issue

about subsidies is not whether they should be continued with, but how they can reach the right beneficiaries with a minimum of leakages.

Larger concerns of the policy makers are:

- Current population base of over 1.3 billion people (growing at 1.2 percent per annum).
- Deterioration in soil health due to imbalanced use of fertilizers.
- Decline in agricultural productivity.
- Sharper urban-rural divide.
- Demand for fertilizer far exceeding indigenous production.
- Ever increasing subsidy bill causing a strain on the exchequer.
- Transparent and fair targeting of subsidy disbursements.
- Declining workforce engaged in agriculture, operations becoming increasingly unremunerative.

To handle these larger issues, controls are inevitable, but the moot point remains: “what level of control” is desirable for all the stakeholders. Unlike many other countries who subsidize agricultural output, in India subsidizes inputs to agriculture.

Challenges faced by fertilizer industry today are:

Supply/availability

• **Limitations of feed stock availability and gas pricing:** Due to dwindling availability of domestic gas, the industry has to depend on the costlier imported RLNG for the shortfall in domestic gas supply. In case of urea, which is under direct government control,

the gas cost increase gets a pass through. But in P&K fertilizers, any increase in gas price will have to be absorbed by the manufacturers leading to spiralling production costs. It is also being contemplated to restrict domestic gas allocation to urea production only leaving out the P&K sector which is under the NBS scheme. This will certainly affect the viability of domestic production of P&K fertilizers.

• **Lack of proper policy for new investments in the sector:** *In spite of spectacular growth in the first forty years, there have been no new investments in the sector in the last 15 years due to lack of policy conducive to growth. In fact, it has been a struggle for survival for those in the business. But recently, the government has notified a new Fertilizer Policy, which encourages revamps of existing plants and capacity building through new projects, by setting up a clear road map for the future. A pooling mechanism has also been implemented to streamline gas supplies so that gas is made available to all urea manufacturers at the same price. It is now expected that some six new urea plants may come up in the near future.*

• **Declining soil health:** The farmlands are slowly giving way to urban development and the arable soil has become less responsive to nutrients. Soil health is deteriorating due to imbalanced use of major nutrients N, P and K and inadequate use of secondary and micronutrients like sulphur, zinc, boron, etc. The organic/carbon content of the soil in most of the states in India is on the decline due to intensive cultivation. Unless the focus of the country

shifts from agriculture to sustainable agriculture, we will continue to draw from the limited natural resources, ravage soil fertility and leave barren fields for our future generations.

Market controls

• **Price:** Urea still continues to be sold at very low prices fixed by the government (even lower than common salt) leading to indiscriminate use and consequent deterioration in soil health. In case of P&K fertilizers which are technically free from price control, there is still an indirect check from the government by way of “reasonableness of price”. Imbalanced use, among other things, is arising due to huge disparity in farmers’ prices of urea vis-à-vis P&K fertilizers. Urea continues to be outside the purview of NBS which is not only widening the price disparity between urea and P&K fertilizers, but also increasing the subsidy burden of the government. Hence, there is a strong case for bringing urea under NBS and restoring price parity. Unless the difference between the MRPs of urea and P&K fertilizers minimizes, there will continue to be a distortion in the NPK ratio.

• **Movement:** The distribution of urea is entirely controlled by DOF. In the case of P&K fertilizers - even though the stated policy stipulates a control on only 20 percent of the quantity - in reality, the control is for 100 percent quantity with movement orders being issued month to month. Many a times, while deciding the allocation, product preferences, farmers’ demand, company

infrastructure, etc. are not kept in mind.


Working capital issues

At present rates, subsidy on urea constitutes approximately 70 percent to 80 percent of the fertilizer turnover, balance coming from the market. As a result, smooth flow of subsidy payments is immensely desirable. However, due to inadequate budgetary allocation, subsidy payments to companies in the past few years had stopped flowing in from around October to April. The requirement of working capital to keep operations running for these seven months is very high and comes at a huge interest cost to the producers. These interest costs cannot entirely be passed on to the consumer.

mFMS system & its inherent weaknesses

In a move to plug leakages in subsidy disbursement and facilitate transparency, the government had envisaged an IT-based monitoring system called mFMS (mobile based Fertilizer Monitoring System) that would capture receipts of fertilizer from the retailer. Data from mFMS is plugged into the FMS (Fertilizer Monitoring System) of the DOF.

The larger chunk of payment of subsidy (95 percent in case of urea and 85/90 percent in case of P&K fertilizers) is released, based on claims made through the Fertilizer Monitoring System (FMS). The balance payments (5 percent for urea and 10-15 percent for P&K fertilizers), however, are triggered off only when the receipt data from retailers is captured in the mFMS. Earlier prior to mFMS - the state departments of agriculture were



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required to certify receipts/sales so that balance claims could be settled.

The fundamental impediment in the mFMS is to expect the wholesaler and retailer to interact on an IT-based system, just to enable companies to get their balance payments.

But today, the states/wholesalers/retailers/farmers are getting uninterrupted supplies of fertilizers. And it is only the industry that is kept waiting for the settlement of balance payments, based on the mFMS system, for more than two years. This calls a fresh look at the intention and implementation of the system.

Conclusion

The country has grown by leaps & bounds economically, politically and socially after independence. India has taken its place on the world stage and solutions to problems will transpire eventually as they surface. It may be time to get back to the drawing board and recast our vision of where we, as a country, intend to take agriculture and consequently fertilizers in the next twenty years or so. The increasing population creates the situation of more hands to work, leading to more mouths to feed. India has a wide gap between potential yield and actual yield of crops. There is considerable scope for increasing crop yield by adopting various improved crop cultivation technologies. Since cultivable land is a limiting factor, the crop yield has to be increased by improving the soil health and fertility. The balanced use of fertilizers in the right quantity, and at the right time, is therefore very important for yield improvement. Soil health cards will give details about the fertility status of the farmer's field. Due emphasis will have to be laid upon proper use of primary, secondary and micro-nutrients, in conjunction with organic manure and bio-fertilizers, as per the recommendations of the soil health card, for sustainable agriculture and increased productivity. ■■■

Fertilizer: The Struggling Strategic Sector



Dr. U. D. Choubey
Director General, SCOPE

The Indian fertilizer industry is one of the most energy intensive sectors within the Indian economy. It is also one of the most important associates of the agriculture sector in the country. It plays a vital role in improving not just the quantity but also the quality of the yield of food grains thereby making India self sufficient in agricultural produce. This can be seen from the fact that from a modest production of 52 million metric ton (MMT) in 1951-52, food grains production stands at 255.36 MMT in 2012-13 which can be directly related to increase in use of fertilizers from 1 Kg¹ per hectare in 1951-52 to 128.34 Kg² per hectare in 2012-13.

Globally, India has achieved the status of being the second largest fertilizer consumer after China. This can be seen from the fact that it accounted for 15.3 percent of world's nitrogenous fertilizer consumption, 19 percent of world's total phosphatic fertilizer

consumption and 14.4 percent of world's total potassic fertilizer consumption in 2008³. However, with continued shrinkage of land availability for agriculture, the only way to retain food sufficiency is to produce maximum yield per hectare wherein fertilizers are likely to play a strategic role and hence, the demand of fertilizers is likely to see an upward trend (as depicted in Table 1).

Not only on the demand side, but India ranks as the third largest producer of fertilizers across the world. In 2014-15, the installed capacity has reached to 132.58 Lakh Metric Ton⁴ (LMT) for nitrogenous fertilizers and 70.60 LMT for phosphatic fertilizers. At present, there are 30⁵ large sized Urea plants, 21 units manufacturing Di-Ammonium Phosphate (DAP) and 2 units manufacturing Ammonium Sulphate (Nitrogen based) as a by-product. In addition, there are 97 medium

Fertilizer Product Demand Forecast (in Million Tons)

	Urea	DAP	SSP	MOP	Complex Fertilizers
2012-13	31.3	11.5	3.8	5.4	10
2013-14	32.6	12.1	4	5.7	10.4
2014-15	33.8	12.6	4.1	6.1	10.9
2015-16	34.8	13.1	4.3	6.4	11.4
2020-21	40.3	15.8	5.2	8.3	13.6

and small scale units producing Single Super Phosphate (SSP).

Out of three key nutrients (i.e. Nitrogen (N), Phosphorous (P)

and Potassium (K)) of fertilizer required by crops, India has raw materials for nitrogenous fertilizers and hence, 80 percent urea

¹ Fertilizer Industry of India- An Overview <http://shodhganga.inflibnet.ac.in/>

² 'Indian Fertilizer Scenario- 2013' by Department of Fertilizers, Ministry of Chemicals & Fertilizers, Government of India

³ 'Fertilizer Market in India- An Insight on Demand Determinants', Vol 3, Issue 1, Jan 2014, Global Journal of Research,

⁴ Annual Report 2014-15, Department of Fertilizers, Ministry of Chemicals & Fertilizers, GoI

⁵ Annual Report 2014-15, Department of Fertilizers, Ministry of Chemicals & Fertilizers, GoI



requirement is met from indigenous production. In case of phosphate, the paucity of domestically available raw material has been a constraint in attaining self-sufficiency and hence 50 percent indigenous capacity has been developed to meet the domestic demand for phosphatic fertilizers. However, potassic fertilizers are largely imported on account of non-availability of viable domestic raw material sources for the same.

Despite of attaining globally competitive capacity utilization levels (97 percent for nitrogen and 59.8 percent for phosphate in 2103-14⁶) the fertilizer industry has been struggling. This is apparent from the fact that out of 23 plants belonging to 7 public sector companies, 6 plants alone are reaping profits. The following section discusses in detail the

issues and challenges being faced by the fertilizer sector.

Issues and Challenges

Constraint on availability of feedstock

Over a period of time the stress has been to use natural gas as the feedstock for production of fertilizer. The twin reason for such encouragement is less pollution as it is a clean fuel and lower cost of production due to higher energy efficiencies. Also, conversion of all fertilizer plants to a single feedstock would harmonise the industry and help to move towards a single urea price and hence decontrol.

At present there are 30 urea units in India, of which 27 units are gas based which have a demand of 45-46⁷ mmscmd gas as against the current consumption of 42 mmscmd. Out of the

total consumption, 28 mmscmd gas is available through domestic sources and balance is met through Regasified Liquefied Natural Gas (R-LNG).

The above reflects a constraint in easy availability of feedstock resulting in higher dependence on imports. Apart from the requirements of the aforesaid existing units, the feedstock would also be required by Naphtha and Fuel Oil based urea units converting to natural gas based units. This is further likely to constraint the supply of already deficient natural gas. This can be seen from an estimated conservative demand of 72.39 mmscmd of gas by urea units by end of 2017⁸ whereas the supply of natural gas to the fertilizer industry (urea units) has been capped at 31.5 mmscmd⁹ till 2016.

From the aforesaid discussion it is clear that due to non-availability of natural gas, either the plants have to stop functioning or produce fertilizer using R-LNG which is expensive making the cost of production high resulting in a higher subsidy outflow.

Alongside, as per the new gas policy of the government, gas shall be supplied to the urea units and no gas would be available to the non-urea units. This is further likely to deteriorate the already sensitive situation of the fertilizer industry. This can be seen from the fact that 3 lakh ton capacity

⁶ Annual Report 2014-15, Department of Fertilizers, Ministry of Chemicals & Fertilizers, GoI

⁷ Gas Pooling & Urea Policy 2015: Impact Analysis; ICRA, June 2015

⁸ Report of the Working Group on Fertilizer Industry for the Twelfth Plan (2012-13 to 2016-17), Ministry of Chemicals & Fertilizers, Department of Fertilizers, Government of India

⁹ Annual Report 2014-15, Department of Fertilizers

of non-urea units have been shut down since May 2014 due to non-availability of natural gas to non-urea units.

Price Control and subsidy

Fertilizers have been identified as goods of special importance and hence the delivery price of the same to the farmers is pre determined/ influenced by the Government.

Till 1991, nitrogenous fertilizers, phosphatic fertilizers, complex fertilizers and SSP were under Retention Price Scheme (RPS) wherein the selling price of the fertilizer was fixed and the difference between cost of production and the selling price was being reimbursed as subsidy to the manufacturers by the Government.

In 1992, prices on phosphatic fertilizers were decontrolled and were allowed to be market driven, however, subsidy system was retained on nitrogenous fertilizers (Urea). Due to this the phosphatic fertilizer became expensive in comparison to Urea. This led to uncontrolled usage of nitrogenous fertilizers leading to imbalance in soil nutrients. Hence, the government provided adhoc concessions to the manufacturers in order to encourage usage of appropriate fertilizers.

With RPS and concessional schemes, the subsidy bill of the government increased 500 percent from INR 13.8 trillion in 2000-01 to INR 99.5 trillion in 2008-09.

In 2010, Nutrient Based Subsidy (NBS) was introduced for P&K fertilizers to further improve the nutrients application and control subsidy payout. Under this scheme, subsidy was fixed on every nutrient of Phosphatic and



As a replacement to RPS for Urea, New Pricing Scheme (NPS) was introduced in April 2003 wherein subsidy was to be given on fulfillment of pre-set energy usage norms. The purpose was to encourage efficiency in usage of energy thereby reducing the cost of production and reducing subsidy outflow. The government introduced NPS III in 2006 wherein the fertilizer companies were classified under 6 categories depending upon feedstock used and technological vintage and subsidy was payable depending upon their energy performance against the pre-set energy norms.

Potassic Fertilizer and the MRP of the fertilizer was left open to be determined as per market forces. However, Urea was still under the RPS.

With the introduction of NBS, ratio of use of fertilizers improved. This is apparent from the fact that against the ideal ratio of N:P:K being 4:2:1, in 1995-96 the ratio of N:P:K was 8.47:2.50:1 which improved to 4.98:2.36:1 in 2010-11. Also, the subsidy bill for the first time saw a decrease to INR 65.8 trillion in 2010-11.

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With the NBS and NPS in place, the subsidy bill of the government stood at INR 71.28 trillion in 2013-14.

In May 2015, the government notified New Urea Investment Policy 2015 wherein the pre-set energy norms have been tightened. This is not only likely to reduce the subsidy payout of the government but is also likely to homogenize the efforts of the companies towards attaining maximum energy efficiency by use of new technology.

Though the government is making all efforts to reduce the subsidy bill and decontrol prices on fertilizers, the need of the hour is to completely decontrol the prices on fertilizers so that the subsidy burden is reduced. It would be more fruitful if the subsidy is actually transferred to the needy farmers directly instead of making subsidy uniform for all.

Financial Strain on Fertilizer Companies

As discussed above, price of sale of urea at the farm-gate is controlled by the Government and the difference between the cost of production and sale price is



reimbursed as subsidy to the fertilizer manufacturers. However, to curb the fiscal deficit the government has been restraining from meeting the subsidy payments to the fertilizer companies and carrying forward the subsidy pay out to the subsequent period. This is apparent from the fact that in financial year 2014-15¹⁰, out of the total fertilizer subsidy provisions of INR 70,500 crores in the budget 2015, INR 32,000 cr. is rolled over subsidy from financial year 2013-14 and it is estimated that INR 25,000 cr. of fertilizer subsidy shall be rolled over to 2015-16.

At present, the fertilizer industry is demanding an immediate payout of INR 35,000 cr. to meet subsidy demands of various fertilizer manufacturers failing which the companies would continue to run in losses or even turn sick in the longer run.

Lack of infrastructure

Success of fertilizer industry is largely dependent on timely

availability of raw materials to the manufacturers and finished product to the farmers.

At present, the rail, road and ports are just managing to handle the fertilizer traffic. With increase in demand and corresponding supply it is essential to develop the associated transporting network also.

Ports for fertilizers

Currently, ports are not well equipped to handle heavy traffic and large containers. With increase in import of fertilizers especially from Gulf and the US, the ports are unable to handle both the volumes and size of the containers. Hence, the need is to augment the port capacities and replace old technologies with the modern ones.

Rail for fertilizers

The rail network has an equal importance in the transportation of fertilizers. This is true for both demand and supply side. All fertilizer plants may not be strategically

located near the ports. Therefore, transferring fertilizer to distant places from the ports can only be transported through rail. Presently, Indian Railways is staggering with excessive limitations of its own including poor condition of rake handling terminals, congested bottleneck routes, highly congested terminals, lack of modern facilities etc. The need is to develop and modernize railways along with introduction of more wagons built to handle such type of material.

Road for fertilizers

Transfer of fertilizer to the farmers takes place through roads and hence, timely availability of the product to the farmers largely depends on the efficiency of the road network in India. At present India has 3 million kms of road including 52,000 kms¹¹ of national highway. Though the figures look very impressive, roads in India face issues with respect to its riding quality and weak and narrow bridges thereby restricting smooth traffic flow. Hence, it is required to plan hurdle free and well maintained highways with capability of handling heavy traffic.

Storage of fertilizers

Fertilizers have cyclical peak and non-peak demand and are not amenable to Just in Time inventory planning. Also, all fertilizers may not be suited to all types of crops. Hence, it is important to have well connected warehousing facilities so that increased demand of fertilizers can be met without delay.

¹⁰ Past Subsidies Rollover To Hit Fiscal Adjustment, Article in Business Standard dated 12 February 2014

¹¹ Report of the Working Group on Fertilizer Industry for the Twelfth Plan (2012-13 to 2016-17), Ministry of Chemicals & Fertilizers, Department of Fertilizers, Government of India

Lack of Research & Development

In spite of constant efforts to develop technological base of the fertilizer industry. India still imports basic processes, know how of manufacturing variants of fertilizers and some critical mechanical and electrical machines. Despite of vast knowledge pool and efficient manpower, research and development (R&D) initiatives in the fertilizer sector have not found ground. Fertilizer as a career option needs to be encouraged by establishing more coordination between the academicians and the industry.

Lack of new investment

Demand for fertilizers is expected to grow from 34.32 MT in 2017-18 to 36.67 MT in 2020-21. In order to meet the increased demand, fertilizer capacities also need to be increased. In order to augment capacity of urea to 33.7 MT in 2016-17 (by 12 MT from present capacity), additional investment of INR 40,000¹² cr. is required. The fertilizer sector has failed to attract new investments primarily on account of highly regulated environment leading to low returns. In 2009-10, fertilizer companies had post tax return of 9 percent - 12 percent as compared to steel, gas, coal and petroleum which had returns of 28 percent, 18 percent, 37 percent and 19 percent respectively. Also, fertilizer sector requires heavy capital investment which can be met through external borrowings. Due to high interest costs, Indian

Further, it may be noted that Fertilizer Control Order (FCO) has prescribed a list of 80 products that can be used as fertilizers whereas only few, on whom subsidies are provided, are marketed. This has resulted in a skewed market share of 78 percent for urea in nitrogenous fertilizers and 62 percent in phosphatic fertilizers.

borrowings market is not very lucrative. Further, 27 percent of operating profit of fertilizer companies went towards servicing debt in 2011-12. This ratio was 16 percent in 2010-11. Low returns combined with high interest costs and high debt coverage ratio with low profitability becomes a negative case for new investment in the fertilizer sector.

Diminishing soil nutrient balance

As discussed above, urea being a cheaper variety of fertilizer is being used excessively resulting in imbalance of nutrients in the soil. This can be seen from the fact that in comparison to ideal ratio of 4:2:1 of N:P:K, ratio of 4.98:2.36:1 was maintained in 2010-11.

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that can be used as fertilizers whereas only few, on whom subsidies are provided, are marketed. This has resulted in a skewed market share of 78 percent for urea in nitrogenous fertilizers and 62 percent¹³ in phosphatic fertilizers. Excessive use of a single kind of fertilizer has resulted in multi nutrient deficiency in the soil leading to decreasing yield.

Way ahead

While the challenges are many, determined efforts are being made by the Government and Companies to revive the struggling fertilizer units. The Government has been issuing and improving on policies in order to reduce the subsidy burden and liberalize the sector. However, it is important that the efforts are directed and implemented in the right spirit so as to gain maximum results.

Following section discusses and outlines key policy initiatives, their purpose, impact of such initiatives and how such initiatives can be made more meaningful.

Forming Joint Ventures (JVs), collaborations and diplomatic alliances

Statistically, India contributes 22 percent to urea imports in global trade, 39 percent to DAP/MAP global imports, 12 percent to MOP global imports, 17 percent to Rock Phosphate global imports and 52 percent to Phosphoric Acid global imports.

Further, with limiting supply of

¹² Report of the Working Group on Fertilizer Industry for the Twelfth Plan (2012-13 to 2016-17), Ministry of Chemicals & Fertilizers, Department of Fertilizers, Government of India

¹³ Report of the Working Group on Fertilizer Industry for the Twelfth Plan (2012-13 to 2016-17), Ministry of Chemicals & Fertilizers, Department of Fertilizers, Government of India

gas from domestic sources, India is also importing natural gas in order to meet its feedstock requirement of urea units.

From the above, it is clear that India's dependence on other countries has been increasing for not only potassic and phosphatic fertilizers but also for urea and gas to produce such urea. The import scenario is worsened by volatile currency market where rupee has been depreciating thereby increasing the import cost. Parallely, the prices of rock phosphate, ammonia and phosphoric acid (raw material for phosphoric and potassic fertilizers) have been increasing further increasing the import cost. This is likely to increase the subsidy burden of the government to INR 0.95 trillion to INR 1 trillion.

In order to control such import costs, Government has been encouraging joint ventures with gas rich and fertilizer raw material rich countries so that buyback arrangements and firm offtake agreements can be made on the prevailing market conditions.

Though the government is showing a positive attitude towards JVs and foreign collaborations need is to make coordinated efforts for the industry as a whole rather than for individual players. For the said purpose, following points merit consideration:

Setting of a Sovereign Fund

Indian companies are finding it difficult to enter many gas rich and potassic/ phosphorous rich markets. In order to do so, a sovereign fund was proposed 3 years back which would be responsible for acquisition of mineral assets abroad and help Indian companies mature deals with their

foreign counterparts. However, no action has been taken on this front.

Setting up an independent sovereign fund would be of great assistance to fertilizer companies as this would provide them a single interface thereby enhancing their negotiation powers along with ensuring a long term supply of nutrients.

Foreign Acquisitions

Many resource rich countries may be unable to exploit their resources. In such cases, Indian fertilizer companies can make investments in developing infrastructure to exploit the resources thereby acquiring ownership of the deficient resources. Government can play a critical role in cross border acquisition of assets. Simplification of rules and regulations in cross border deals in the fertilizer sector and easy financing can go a long way in setting up Indian stakes abroad.

Effective implementation of new policies

The Government of India has recently announced a slew of policy measures in order to facilitate the fertilizer sector. Key policy announcements in 2015 include Gas Pooling, New Urea Investment Policy 2015 and allowable levels of producing neem coated urea to 100 percent. However, it is imperative that the said policies are implemented in the right spirit so as to derive maximum benefit for the fertilizer sector.

Gas Pooling promoting energy efficiency of units

Natural Gas is the main feedstock of urea companies. However, with decrease in production of gas from available domestic

resources, companies are importing gas (R-LNG) thereby increasing the cost of urea and correspondingly, increasing the outflow of subsidies. Further, since individual companies enter into stand alone contracts with gas producers, cost of gas varies from contract to contract giving rise to low cost gas benefits to some and high cost gas disadvantage to others importing R-LNG.

In order to remove this differential in cost, on 20th May 2015, Government notified Gas Pooling for the urea sector.

Under the gas pooling arrangement, natural gas from all sources (domestic and imported) would be pooled and then supplied at uniform prices to all urea plants connected to the natural gas grid.

Since the onus for supply of gas would be on the gas suppliers and gas pool operator (i.e. GAIL (India)), the focus of the urea plants should shift to their core business. Also, by aggregating the gas demand, the pool suppliers may be able to negotiate the price of gas (specifically the imported gas) more effectively. Yet another advantage of this policy is that many units which were not able to produce urea beyond the cut-off/ reassessed quantity in 2015 due to high cost of gas should now be able to do so.

In addition to the above, gas pooling provides an impetus for setting up new Greenfield/ brownfield urea plants. With gas pooling, the prices of gas would be leveraged across the industry resulting in uniform and reasonably low gas pricing and hence lower the cost of production of urea.

The Department of Fertilizer estimates that gas pooling could lead

to additional urea production of 3.7 MMT from existing units during 2016-2019 leading to reduction in dependence on imports thereby saving INR 1550 cr. of subsidy.

Though gas pooling is a positive step for the urea sector, non urea sector has been deprived of this benefit.

Hence, the need of the hour is to simultaneously work out a similar policy for non urea plant operators so as to ensure viability of operation of a phosphoric fertilizer plant.

New Urea Investment Policy 2015(NUIP)

The Government has introduced New Urea Investment Policy 2015 to be effective from June 2015 to March 2019. This policy is to be applicable for 25 units producing urea using gas as feedstock however 3 units producing urea using Naphta/ FO/LSHS would be still covered under the NPS III scheme.

Under the NUIP, 25 urea producing units are regrouped in 3 categories and would be eligible for concession rate on the basis of revised energy norms fixed for each group. The norms have been tightened from the erstwhile NPS III scheme. Also, under the NPS III scheme, with gas prices increasing, production beyond 100 percent reassessed capacity was becoming unviable and hence, units were being closed down. However, under the NUIP, production beyond reassessed capacity would make the unit eligible for variable cost along with per MT incentive equal to the lowest of per MT fixed cost of the domestic urea units.

The aforesaid policy is a positive step towards improving energy

efficiencies of existing urea units. With the tightening of the energy norms, units which have already undertaken energy saving project would benefit and units which are yet to undertake energy savings projects would be motivated to expedite technology renovation so as to get maximum benefits under the NUIP and thereby attain global competitiveness.

However, NUIP would only find a footing and help in homogenizing the urea industry if all the units are based on similar norms. At present, 3 units are operating on Naphtha/ FO/LSHS feedstock due to non-availability of gas pipeline and 2 are not operational due to technology obsolescence. This differentiation might not look very positive for the new policy. Hence, it is important that units which are on an alternative feedstock should be put on gas grid at the earliest and NUIP should be applicable to the said units also.

Further, at present all units are not energy efficient and hence, might lose out on the benefits. Though it may be argued that the policy would encourage the non-efficient units to undertake energy efficiency projects at the earliest and make them internationally competitive but practically, the process is time consuming and may affect the units adversely in terms of not only performance but also profitability during the up-gradation process.

Neem Coated Urea

In January 2015, the Government allowed urea producers to produce neem coated urea upto 100 percent and made it mandatory to atleast produce 75 percent of urea as neem coated urea.

Excessive use of urea deteriorates

the soil quality and is detrimental to the yield in the long run, Neem coated urea slows the release of urea in the soil thereby helping plants gain more nutrients thereby resulting in a healthier yield. Further, neem coated urea is unfit for industrial use and hence, diversion of urea by manufacturers for industrial use would also be curtailed.

On one hand where neem coated urea is likely to improve profitability of the producers as it is pegged at INR 268 per MT which is higher than urea and hence is likely to reduce the subsidy bill of the government by approximately INR 6500 cr. annually, shifting to 100 percent neem coated urea may result in non availability of urea for commercial use such as for cosmetic manufacturers, bio-fuel industry, furniture industry, pharmaceutical industry. Also, excessive production of neem coated urea can put upward pressure on price of neem oil which is an important ingredient for the cosmetic industry, pesticide industry (used in bio pesticides), ayurvedic/ unani medicines etc.

Introduction of Goods & Service Tax

India is in the process of implementing Goods and Service Tax (GST) regime wherein indirect tax levies including value added tax (VAT), Excise Duty, Entry Tax and Service tax would be subsumed under a single taxation system of GST. It is proposed that the levy shall be a dual levy by the Centre (known as Central GST) and the State (known as State GST) respectively.

However from the fertilizer sector's perspective following points merit consideration under the new regime of taxation:



- It has been agreed that natural gas and petroleum products shall be kept outside the purview of GST. This would be a major setback for the urea units as they would be unable to take input tax credit of tax paid on purchase of natural gas which would be then built in the price of urea making it expensive. Also, keeping essential industrial goods such as natural gas and petroleum products outside the tax purview would defeat the entire purpose of removing cascading effect of taxes making the impact significant on cost of production.

- The taxes and duties on fertilizer products is payable on MRP which is determined/ influenced by the government. As a result of which tax paid on sale of fertilizers is far less than taxes paid on inputs used in production of fertilizers resulting in unused input tax credit. At present, there are no rules or regulations for usage of such unadjusted credit. The situation is likely to continue in the GST regime also.

Marketing Management in Fertilizer Sector

Fertilizer is a very peculiar sector when it comes to marketing

the finished product to the end consumer. Placing the fertilizer industry in a typical marketing model following points would emerge:

- Fertilizer industry has suppliers with little or no bargaining power. The feedstock for the fertilizer is natural gas which is a highly regulated input by the Government, The price and supply both are determined/ influenced by the government.

- Barriers to entry are high as the nature of the sector is highly capital intensive and long time span to earn returns and most of the time returns are not in tandem with the investments made. Also, the fertilizer industry is highly regulated and monitored by the government thereby making induction of new players difficult.

- A dual customer base being fertilizer distributors and farmers both having low bargaining power.

- There is little or no competition amongst the fertilizer as prices are generally determined on mutual consensus and that too on influence by the Government.

Basis the above, marketing challenges to this kind of a highly

regulated and externally dependant industry are also many:

- With little or no innovation in the product base, the biggest marketing challenge is to ensure that the company's products are clearly identifiable by the end consumer. The importance is to develop brand image and brand identification.

- With little freedom on pricing of the product, there is no price difference between varieties of fertilizers in the market making it more challenging to market the product. Therefore, the only marketing strategy would be with respect to customizing fertilizers to the customer needs.

- Strong distribution network needs to be developed so as to ensure that the products reach the customers at earliest and with minimum lead time. Ability to cross geographic barriers can play a key role in giving a high recall value to the fertilizer company.

- End customer (i.e. farmer) should be given extended services such as soil testing so as to gain a greater recall value.

Looking at the above, it can be summarized that fertilizer sector has a highly regulated market and the players of the industry enjoy little freedom to be competitive. However, this makes it more challenging for the fertilizer companies to develop a brand image for their products.

Public Sector in the Fertilizer Domain

The Indian Public Sector is very significant in the fertilizer sector. This is apparent from the fact that the first fertilizer plant in India was set up in Sindri by

a public sector enterprise (PSE) in 1951. At present, there are 7 PSEs engaged in fertilizer production namely Rashtriya Chemicals & Fertilizers Ltd. (RCF), National Fertilizers Limited (NFL), Brahmputra Valley Fertilizers Corporation Limited (BVFCL), Madras Fertilizers Limited (MFL), Fertilizers and Chemicals Travancore Limited (FACT), Hindustan Fertilizers Limited (HFL) and Fertilizers Corporation of India Limited (FCIL)¹⁴. The said PSEs have 23 plants¹⁵ and occupy 20 percent¹⁶ of the total fertilizer market share in the country. As on 31 March 2014, government had invested INR 152.15 trillion¹⁷ in the public sector companies in fertilizer industry and the said companies employed 12,706 people.

Public sector in the fertilizer sector has installed capacity of 37.64 LMT of nitrogenous fertilizers and 3.87 LMT of phosphatic fertilizers. As against the installed capacity, capacity utilization for nitrogenous fertilizers was 93.58 percent in 2014-15 and 94.7 percent in 2013-14, for phosphatic fertilizers the capacity utilization was 61.76 percent in 2014-15 and 65.5 percent in 2013-14¹⁸. Further, despite of a difficult year in terms of lack of sufficient feedstock and rising gas prices, the public sector

was able to achieve 94 percent of its production target for nitrogenous fertilizers and it produced beyond its targeted production for phosphatic fertilizers in 2014-15¹⁹.

Despite of pioneering steps by the Indian PSEs, the present situation is very dismal for them. Out of 23 plants being operated by 7 PSEs, only 6 plants are reaping profits. Further, out of 7 companies, only 3 companies (RCF, NFL and MFL) are into profits and 2 (HFC and FCIL) are closed since 2002. The fertilizers PSEs as a cognate group are into net loss of INR 5.13 trillion in 2013-14 and 101.95 trillion in 2012-13²⁰.

Beside increase in price of feedstock and constraint in availability of natural gas, key reason for sickness/ loss of PSEs are:

- Financial constraints due to non-payment of subsidy by the government leading to net loss situation and drain on the balance sheet of the companies.
- Outdated and obsolete technology leading to drain of resources with low output
- High energy consumption leading to incremental cost of production
- Lack of trained manpower leading to decreased motivation

levels and lower innovation ability

However with the dismal state of the sector, the Government has realized the importance of PSEs in the fertilizer sector and has rolled out active plans for revival of the same. The revival plans are in line to attain self sufficiency in production of fertilizers and encourage 'Make In India' for fertilizers thereby reducing dependence on imports.

- The government has identified Talcher and Ramagundam units of FCIL for revival by building a consortium of profit making PSEs. Talcher unit is to be revived by the consortium of RCF, GAIL (India) and Coal India Limited. However, the concept model of a gas based fertilizer plant through coal gasification was conceived when I had the privilege of serving GAIL. It was contemplated that Coal India Limited will join for providing the coal linkages for its gasification, GAIL will lay the necessary pipeline infrastructure and RCF would commission the Fertilizer Unit. This has made a good headway as MOU has been signed between the entities for revival.
- Alongside, Ramagundam unit is to be revived by the joint venture of NFL, EIL and FCIL.
- Sindri unit of FCIL has received

¹⁴ Department of Fertilizers

¹⁵ Business Standard dated 26 July 2014

¹⁶ Public Sector Enterprise Survey 2013-14, Volume I

¹⁷ *ibid*

¹⁸ Annual Report 2014-15, Department of Fertilizers

¹⁹ *ibid*

²⁰ Public Sector Survey 2013—14 Volume I, Department of Public Sector Enterprises



additional investment of INR 6,000 cr.²¹ for its revival. The revival of the said unit is likely to create employment for 500 people directly and over 3000 people indirectly.

- A comprehensive plan is being developed for revival for BVFCL by BRPSE

The efforts of the government are worth appreciating but a lot more needs to be done.

First and foremost the subsidy pay outs need to be made to the fertilizer PSEs so that they can adjust losses on account of subsidy. The government has been holding back subsidy payments in order to meet its fiscal deficit target.

Alongside, government needs to allocate funds to vintage units to upgrade and maintain their technology and facilities. The vintage nature of fertilizer units of PSEs along with successive non-conducive policies, the PSEs are left with little or no surplus funds leading to their gradual decline and ultimately sickness.

The Government of India has recently announced a slew of policy measures in order to facilitate the fertilizer sector. Key policy announcements in 2015 include Gas Pooling, New Urea Investment Policy 2015 and allowable levels of producing neem coated urea to 100 percent. However, it is imperative that the said policies are implemented in the right spirit so as to derive maximum benefit for the fertilizer sector.

Non availability of gas has been an issue with fertilizer companies but a bigger issue is with respect to non-connectivity of fertilizer units to gas pipelines. In present

times also, when it has been an unsaid mandate for all fertilizer units to convert to gas based production of fertilizers, eastern India is yet to be placed on the gas map. This has forced PSE fertilizer units in eastern India to operate on naphtha and fuel oil resulting in higher cost of production and hence, greater subsidy requirement.

Conclusion

The Fertilizer Sector has been one of the key strategic sectors in India but has been trying to cope with all the challenges.

Going forward, the government needs to strike a balance between the requirements of both the farmers and the fertilizer companies. Though there has been a steady increase in demand for fertilizers, however the same has not been supported by incremental production. This has resulted in dependence on imports thereby depleting forex reserve of the country.

With 'Make In India' gaining momentum, it is imperative that our domestic fertilizer units are strengthened so as to increase domestic production and contribute in making 'Make In India' a success. The coming times are not only difficult but filled with numerous challenges for the fertilizer industry. To rescue the wellbeing and development of the fertilizer sector, the Government should continue with its emphasis on on the sector and undertake more long term policies. ■■■

²¹ India Public Sector, 22 May 2015

Reviving FCI's Talcher Unit

Coal could be the answer to the fertilizer industry's cry for an alternative to natural gas, as feedstock, for urea production.



R. G. Rajan

CMD, Rashtriya Chemical & Fertilizers Ltd

Introduction

On the agenda of the Government of India, on a priority basis is the revival of closed fertilizer units like the Fertilizer Corporation of India (FCI) and Hindustan Fertilizer Corporation (HFC). This is being done in order to augment domestic urea capacity so that the gap between domestic production and actual consumption of urea may be bridged. The above mentioned units have excellent existing infrastructure in the form of land, residential townships, railway sidings etc.

The Talcher unit of FCI is one of the five revival projects already announced by the government. A consortium of four state run companies, namely RCF, CIL, GAIL and FCI has been nominated by the government for revival of the said unit. The consortium members signed a Memorandum of Understanding on September 5, 2013 to take the project forward.

Project Concept

Among the various feedstocks



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that can be used for urea production, natural gas is the most preferred one. Barring a few, most of the country's old urea plants, which were earlier naphtha or furnace oil based, have switched

over to natural gas. The newer plants have been set up with gas based technology. However, of late, the availability of natural gas as well as its rising price has become a matter of great concern for the fertilizer industry in sustaining its plant operations. The dwindling domestic gas supply position in the country is further aggravating the situation. At the same time, the country's ever increasing urea requirement has necessitated the creation of additional domestic urea capacities to avoid the vagaries of import dependency. Under these circumstances, it has become imperative for the country to explore alternative feedstock that can be sourced in a sustainable way, at a proper price, to ensure economic viability of the plants to remain competitive.

In the quest for a solution to this compelling need, coal has emerged as the best possible option as the country is endowed with rich reserves of coal. Coal is already in use as feedstock for the

production of fertilizers, chemicals and liquid fuels in many countries like China and South Africa.

In view of the above, it was decided that coal should be used as feedstock for the Talcher project. The project aims to find an alternative source of feedstock in the domestic scenario, where natural gas is always in short supply.

Coal Gasification Process – Challenges in the Indian Context

Gasification is the process of converting solid hydrocarbon feedstock - like coal - into a mixture of gaseous components, by partial oxidation, with the application of heat under pressure in the presence of steam.

A gasifier, which is the heart of the gasification process, differs from a combustor. Its distinctive feature is the careful control on the amount of air (or oxygen) available inside the gasifier, to ensure that only a relatively small

portion of the feedstock burns completely. This 'partial oxidation' process provides the heat and in the process most of the carbon-containing feedstock is chemically broken apart by the gasifier's heat and pressure. This sets into motion chemical reactions that produce a mixture of gases which are primarily hydrogen and carbon monoxide, but can include other gaseous constituents like carbon dioxide, methane, etc. The composition varies depending upon the conditions in the gasifier and the type

of feedstock. The gas mixture is purified through a series of steps and in the purification process, the carbon monoxide (CO) gets converted into carbon dioxide (CO₂). The CO₂ is recovered for further use in the production of urea. The hydrogen mixed with nitrogen in the ratio 3:1 is then sent for ammonia synthesis.

The process of coal gasification is not new. However, the recent price rise in gas has rekindled the interest in coal gasification in many countries. It is therefore being adopted on a large scale for producing syngas, as it is more economically viable. An outstanding example of this is China, with its large deposits of coal. China is leaving no stone unturned to fulfill its demand for gas through coal gasification and to reduce its dependence on Liquefied Natural Gas (LNG). In fact, more than 70 ammonia/urea plants in China, accounting for 80 percent of its production, use coal as feedstock.

The main concern in the adoption of coal gasification process in

On the agenda of the Government of India, on a priority basis is the revival of closed fertilizer units like the Fertilizer Corporation of India (FCI) and Hindustan Fertilizer Corporation (HFC). This is being done in order to augment domestic urea capacity so that the gap between domestic production and actual consumption of urea may be bridged. The above mentioned units have excellent existing infrastructure in the form of land, residential townships, railway sidings etc.



Talchar Unit

India is the 40 to 45 percent ash content in domestic coal, which is quite high. The most challenging aspect of coal gasification is therefore adopting the most appropriate technology. In countries like China and South Africa, many gasification plants run on continuous operation basis, when the ash content in coal is up to 30 percent and with higher ash content, the plants have run for short periods. To ensure smooth operation of the Talcher project, a coal washery is contemplated to reduce ash content to the desired level, so that it may be used in the gasification process.

In India, the JSPL plant at Angul has been using coal with 37 percent ash content for its coal gasification operations. At present, however, it is operating much below its rated capacity due to non-availability of suitable coal and a lull in demand for steel.

Project Details

The Talcher project envisages establishing a fertilizer complex comprising of a 2200 MTPD Ammonia plant and a 3850 MTPD Urea plant through the coal gasification route. The estimated project cost will be around Rs.8000 crore.

In pursuance of the project, Expression of Interest (EOI) has been issued for pre-qualification of licensors in respect of coal gasification technology. A number of technology suppliers have responded to the EOI and the selection of coal gasification

With no functioning urea manufacturing unit in the eastern region after the closing down of the FCI and the HFC plants, it is envisaged that the completion of the Talcher project will be a boon to farmers of Odisha and the neighboring states. What is more, the project will help enhance and hasten the economic development of the region.

technology is on the verge of being finalized. For the downstream plants of ammonia and urea, also, a LSTK tender has been floated. PDIL has been appointed as the consultant for the preparation of DFR.

Project road map

A Joint Venture Company is in the process of being formed by the consortium members. After the formation of the JVC, the appropriate coal gasification technology for the project will be decided upon. A 'Coal Block' has been identified and action has been initiated to get it allocated

from the government to ensure a long term, assured supply of coal for the project.

The other key issues in the development of the project that have to be addressed on a priority basis are:

- i. Developing the Basic Design Package along with FEED for the Coal Gasification section.
- ii. Incorporating a proper plan to commercialize by-products like Tar, CO₂, Phenol, Benzole, oil etc. from the coal gasification unit, to increase the project viability.
- iii. Developing a suitable alternative for the use of middlings and rejects from the coal washery in a commercially gainful manner.
- iv. Developing an appropriate disposal method for the ash in an environment friendly manner, including the option of its possible commercial use.

It is expected that all the above activities will be completed soon. With the clear intent of the Government of India to fast track the revival project, we will hopefully receive the necessary clearances and approvals within a year. This will enable the project to take off for early completion.

With no functioning urea manufacturing unit in the eastern region after the closing down of the FCI and the HFC plants, it is envisaged that the completion of the Talcher project will be a boon to farmers of Odisha and the neighboring states. What is more, the project will help enhance and hasten the economic development of the region. ■■■

Opportunities and Challenges

in Fertilizer Sector



Satish Chander

Director General, FAI

The role of Fertilizer as a vital input for enhancing agricultural production and ensuring food security is well established. HYV seeds, irrigation water and Fertilizer use transformed India from a food deficit country to a food self-sufficient country after the adoption of New Agricultural Strategy in mid-60s. Available studies indicate that about 50 per cent of additional food grain production comes through the use of Fertilizer alone. India witnessed a remarkable growth in Fertilizer consumption since mid-60s. The country emerged as the second largest consumer of fertilizers in the world next to China. The Indian Fertilizer Industry has made significant contribution to this achievement by arranging supplies from domestic production and imports to millions of farmers in the country.

Trends in Fertilizer Consumption

Fertilizer consumption increased significantly over the last four and half decades. Fertilizer nutrient consumption (N+P+K) increased from 0.78 million tones (MMT) in 1965-66 to 28.12 MMT

Table 1: Trends in Consumption of Fertilizers

(Million tones)

Year	N	P2O5	K2O	Total
1965-66	0.57	0.13	0.08	0.78
1970-71	1.48	0.54	0.24	2.26
1980-81	3.68	1.21	0.62	5.52
1990-91	8.00	3.22	1.33	12.55
2000-01	10.92	4.21	1.57	16.70
2010-11	16.56	8.05	3.51	28.12
2013-14	16.75	5.63	2.10	24.48
2014-15 (Provisional)	17.01	6.08	2.50	25.60

in 2010-11. Thereafter, there was a negative growth in consumption of total nutrients as a result of fall in consumption of P & K nutrients. During 2014-15, total nutrient consumption was 25.60 MMT. Table 1 shows the trends in consumption of Fertilizer nutrients during the past five decades.

In terms of products, total Fertilizer consumption was 54.17 MMT during 2014-15, of which the consumption of urea was 30.88 MMT, DAP 7.56 MMT, SSP 4.23 MMT, NP/NPKs 8.21 MMT and MOP 2.78 MMT. Remaining quantity was in the form of Ammonium sulphate & Ammonium chloride.

Developments in Fertilizer production

The pricing policies in 1970s and 1980s encouraged substantial addition in indigenous capacity. India emerged as third largest producer of nitrogenous and phosphatic fertilizers in the world next to China and USA. In fact, India became self-sufficient in urea production during early part of the decade of 2000. However, changes in policy parameters since the decade of 2000 have been affecting adversely the viability of the industry. There has been no new grass root Fertilizer plant commissioned since 2000 due to environment of uncertainty in Fertilizer

sector. Production of nitrogen (N) has increased by mere 1.49 million tones between 2000-01 and 2014-15, whereas consumption increased by 6.09 MMT

during the period. Production of P_2O_5 has increased by 0.38 MMT between 2000-01 and 2014-15, whereas consumption increased by 1.87 MMT during

the period. **Table 2** presents development in capacity and production of Fertilizer nutrients during past four and half decades.

Table 2: Development in capacity and production of Fertilizer nutrients

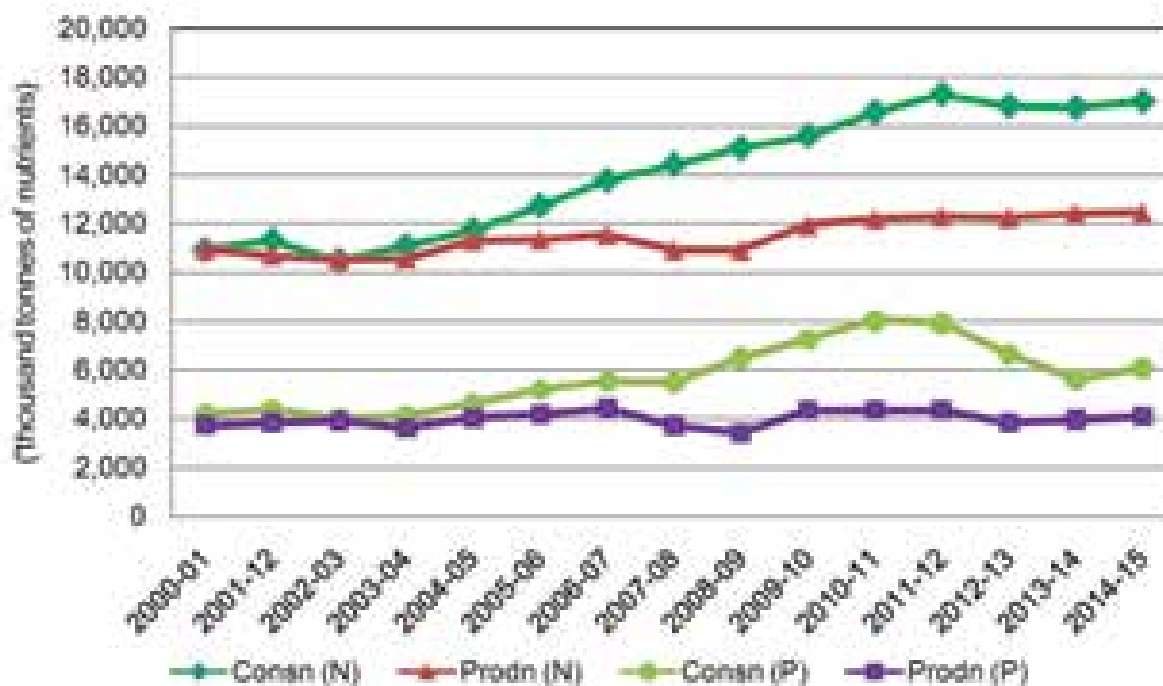
(Million tonnes)

	Installed capacity			Production		
	N	P_2O_5	N+ P_2O_5	N	P_2O_5	N+ P_2O_5
1970-71	1.35	0.43	1.78	0.83	0.23	1.06
1975-76	2.63	0.74	3.37	1.51	0.32	1.83
1980-81	4.36	1.33	5.69	2.16	0.84	3.00
1990-91	8.15	2.77	10.92	6.99	2.05	9.04
2000-01	11.99	4.99	16.98	10.94	3.73	14.67
2005-06	11.63	5.46	17.09	11.33	4.20	15.53
2010-11	12.57	6.20	18.77	12.18	4.37	16.55
2013-14	13.53	6.72	20.25	12.41	3.97	16.38
2014-15	13.53	6.84	20.37	12.43	4.11	16.54

Increasing dependence on imports

Almost stagnant production and sharp increase in consumption created increasing gap between the two. **Figure 1** shows increasing gap between consumption and production of Fertilizer nutrients during the past one and half decades.

Fig.1: Gap between consumption and production of N and P_2O_5



The wide gap between consumption and production of fertilizers has been fulfilled through higher imports. India was self-sufficient in urea production in early decade of 2000. The import of urea kept on increasing since 2005 and crossed 8.75 MMT in 2014-15. Similarly, India imported 0.86 MMT of DAP in 2000-01 which crossed 7 MMT in 2010-11. Thereafter, import of DAP fell due to fall in demand for P&K fertilizers (Table 3).

Table3: Rising imports of Fertilizers

(Million tones)

Year	Urea	DAP	MOP
2000-01	0	0.86	2.65
2005-06	2.06	2.44	4.58
2010-11	6.61	7.41	6.36
2011-12	7.83	6.91	3.98
2012-13	8.04	5.70	2.50
2013-14	7.09	3.26	3.18
2014-15	8.75	3.82	4.18

To encourage investment for new capacities, Government of India notified Investment policy in 2008. The policy could not attract investment for new urea plants. It facilitated addition in capacity of urea by about 2.5 million tones through debottlenecking/ re-vamp. The Government notified a New Investment Policy(NIP)in January 2013 and came out with an amendment to the policy in October 2014. NIP addressed the issue of increase in gas price by allowing floating floor and ceiling linked to delivered gas prices.

Constraints in Availability of Feedstock

Natural gas is the ideal feedstock for production of all nitrogen containing fertilizers. Urea is the main nitrogen containing Fertilizer accounting for almost 82 per cent nitrogen used in the country. Under the policy direction of the government, most of the naphtha based and all the four fuel oil based urea plants switched to natural gas as

feedstock in last ten years. Only three naphtha based urea plants in South India continue to use naphtha due to absence of gas pipeline connectivity to these plants. These plants are ready to use gas but pipeline has not been completed even after wait of more than five years. At present, 95 per cent of urea production capacity in the country is based on gas.

Gas Supply

There was a production of 22.6 million tones of urea in 2014-15. Of this, 21.6 million tonne production was based on gas. Indian gas based plants used an average of 43 MMSCMD of gas in 2014-15. The availability of domestic gas was 27 MMSCMD and rest was imported. The LNG to the extent of about 9 MMSCMD was imported under long term contracts and about 6 MMSCMD was bought in spot market. The total gas requirement to produce 23.5 million tones urea and about 3.5 million tones of complex fertilizers is about 50 MMSCMD.

Given the present domestic supply of about 29 MMSCMD, there is an additional requirement of 21 MMSCMD of domestic gas to make up for the shortfall, substitute the imported gas and change of feedstock in three remaining naphtha based plants. Any additional capacity will require allocation of more gas beyond this quantity.

Cost of Gas

Due to high use of imported gas, the weighted average delivered cost of gas may be around US\$10.50 per million BTU. The delivered cost of LNG imported under long term contract is exorbitantly high and is in the range of US\$18-20 per MMBTU. In spite of high cost of gas, Indian plants are competitive and producing urea at cost lower than imported urea.

Infrastructure

There is a need for additional capacity of at least 10 million tones of urea. Availability of land is not a problem. Almost all the proposed new projects are brown field projects. These sites in addition to available land, have other infrastructure facilities like utilities, railway siding, etc. But there is need for expansion of infrastructure at ports, railways, roads, warehousing, etc. to transport and distribute about 55 million tones of Fertilizer products and about 12 million tones of raw materials through the year.

Energy Efficiency of Indian Fertilizer Plants

Production of ammonia and urea are highly energy intensive. The vintage of existing plants varies from 15 to 48 years. But the Fertilizer companies have been

continuously investing in upgradation of technology, replacement of old equipments, installation of advanced process control systems with optimization of operation and maintaining both rotative and static equipments in excellent condition. As a result, the Indian Fertilizer plants have high operating factor and are highly energy efficient. The efficiency of Indian plants is comparable to the best in the world. Of the total energy requirement to produce urea and other fertilizers, about 80 per cent of energy is spent in production of ammonia. Energy efficiency of ammonia is used as bench mark internationally. International Fertilizer Industry Association (IFA), Paris carried out a survey of world ammonia plants. The data are also available from other sources. According to the latest data available, Indian gas based ammonia plants with average energy consumption of 8.29 GCal per tonne were the most efficient compared to plants in different countries and average of 76 plants across the world (Figure 2). The new plants will be based on the best available technology in the world. There is no technological gap between

Fertilizer plants in India and advanced countries.

Joint Ventures

Heavy Dependence on Imports

India lacks the natural resources for production of fertilizers and is heavily dependent on import of raw materials and finished products. India produced 75 per cent of its requirement of urea and balance is imported. Even the present production of urea is dependent on imported LNG to the extent of 35 per cent of total gas requirement. India is self-sufficient to the extent of 50 per cent in production of phosphate and potassic fertilizers. The indigenous production of these fertilizers is 90 per cent dependent on import of raw materials for phosphates and 100 per cent for potash. In such a situation, there is obvious need for acquisition of raw material assets and also for putting up production facilities in resource rich countries to secure the supplies of fertilizers.

Joint Ventures in Operation

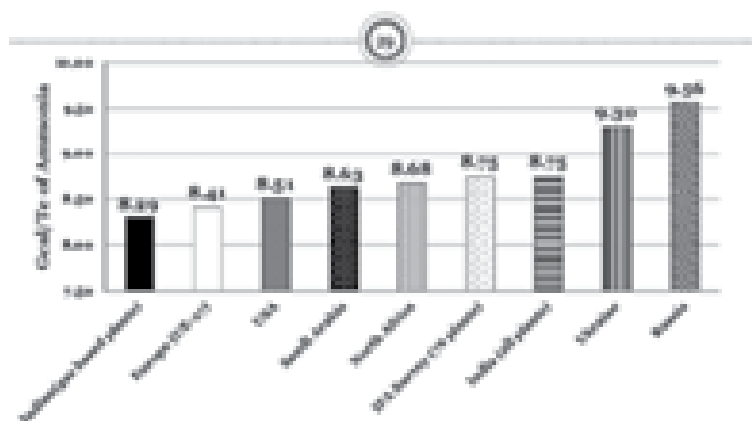
Government has been encouraging investment in joint ventures abroad. Several companies have

put up joint ventures in Senegal, Morocco, Tunisia and Jordan for production of phosphoric acid, an intermediate chemical required for production of phosphatic fertilizers. Similarly, a large joint ventures for production of urea is operating in Oman.

Continued Efforts for Joint Ventures

In spite of these successes, Indian companies are finding it difficult to bring up new projects. Efforts of several companies have not met success in last 15 years for putting up urea plants in Nigeria, Ghana, Iran, etc. Reasons are many and relate to security of investment and manpower, availability of infrastructure, availability of gas at right price, etc. Acquisition of raw material assets like mines for rock phosphate and potash is even more difficult. These are long gestation period projects with high capital investment and therefore involve high risk. Individual companies neither have the capital nor the risk appetite for such investment. The domestic policies for Fertilizer sector have also proved to be an impediment in taking such investment decisions.

Fig. 2: Benchmarking of Ammonia Plant 2010-11



Source: FAI & Nitrogen + Syngas, Vol. 325, Sept. - Oct. 2013

Incentivizing Joint Ventures

Industry has suggested that central government create a corpus of US\$20 billion to invest partially in equity and to extend soft loan for Fertilizer joint ventures abroad. This would greatly help to make such projects viable for companies. Any reduction in cost of fertilizers will help to reduce the subsidy bill of the government and make fertilizers available to the farmers at affordable prices on sustained basis even without subsidy.

Opportunities and Challenges in Fertilizer Sector

Opportunities

Fertilizers are one of the essential inputs for agriculture. It has been proven that about 50 per cent increase in yield of crops has been realized due to application of fertilizers. There is still need to increase the yield of crops and grow more food, fibre and fodder from ever shrinking land under cultivation. Yields of major crops in India are much lower than China and other neighboring countries. There is large unrealized potential for increasing crop yields. Fertilizers will play still bigger role along with other agri-inputs in achieving higher agriculture productivity. Therefore, fertilizers are indispensable for Indian agriculture and here lies the opportunity for Fertilizer industry.

Strengths of Fertilizer Industry

Fertilizer industry in India is one of the most efficient industries in the world. It employs state of the art technologies for production of a variety of Fertilizer products. It has large capital assets on the ground with latest production technologies. The availability of trained and highly skilled manpower is also a strength of this sophisticated industry. Yet, another strength of the country in this area is large capital goods industry which can supply most of the plants & machinery for construction and revamp of Fertilizer plants. The Fertilizer plants in India have been constructed with local engineering and construction manpower. This along with availability of indigenous equipments enable India to put up similar capacity plants with lower capital investment than in other developing and

developed countries.

Challenges

Indian industry faces a serious handicap due to very limited availability of raw materials including natural gas. The custom duty of up to 5 per cent on import of both raw materials and finished products poses, unfair competition from imports. Fluctuating foreign exchange rate further exposes the domestic industry to undue risk. The challenge of procurement of raw materials at steady prices can be met by making large investment in acquisition of raw material assets abroad. Fertilizer pricing and subsidy policies present serious challenge to continued viability of the industry as explained in following paragraphs.

Macro Policy Environment for Fertilizer Sector

There is no other industrial sector as heavily regulated as Fertilizer sector. The regulatory environment for the sector can be broadly divided into two categories: quality and retail price of products, and production & distribution of fertilizers.

Quality and Price of Fertilizers

Quality and Movement of Fertilizers: Fertilizers are covered by Essential Commodities Act, 1955. Fertilizer (Control) Order (FCO) 1957 is an executive order under the Act and amended from time to time regulates prices and quality of fertilizers. The order includes the specification of various Fertilizer products with respect to nutrient content, moisture content, particle size of products and some other parameters specific to each product. The Order (FCO) also gives tolerance limits beyond specification and methods for

testing of fertilizers. No Fertilizer products can be manufactured or sold in India which is not included in FCO. State governments are responsible for implementation of the Order. Both Central and State governments have quality control laboratories in different states of the country. In addition, government also regulates the movement of fertilizers under Fertilizer (Movement Control) Order 1973.

Retail Prices of Fertilizers

Urea accounts for almost 50 per cent of Fertilizer consumption in the country. The retail price of urea is controlled by the government. It is sold at same price throughout the country exclusive of local taxes. Due to artificially low retail price, government bears heavy subsidy burden on sale of urea. About 75 per cent of cost of urea is subsidy and farmers pay only 25 per cent of its cost of production or import. The retail prices of phosphatic & potassic (P&K) fertilizers, also called complex fertilizers have been decontrolled. However, government provides a fixed subsidy on each product included under Nutrient Based Subsidy (NBS) policy. Government monitors the retail prices of all decontrolled fertilizers covered under NBS scheme throughout the country through its Fertilizer monitoring systems (FMS). Government also decides on the reasonableness of the retail price of a product using certified cost data submitted by the individual companies.

Production and Distribution of Fertilizers

Product Subsidy: Subsidy on fertilizers both for urea and other fertilizers is routed through Fertilizer manufacturers and

importers. Subsidy is paid to the manufacturers or importers and they have to sell fertilizers to the farmers at controlled price (urea) or monitored prices (other fertilizers). The system is in operation since 1977 and has become very complex and cumbersome over the years. Government in its anxiety to control the subsidy bill has been squeezing industry to the extent that many production units have been rendered unviable. For example, urea pricing and subsidy policy is a mix of cost plus and normative system. Urea units are reimbursed fixed, variable and conversion costs on normative basis. These norms have been tightened over the years to the extent that these are hurting the industry. There is also under recovery of fixed costs due to non-updation of these costs to keep pace with inflation. As a result half of urea units are making losses. Import of urea is canalized and imported on government account by three designated state trading enterprises. There is a fixed subsidy on phosphatic and potassic fertilizers under NBS policy. This segment of industry faces unfair competition from imports due to same level of custom duty on raw materials and finished products. Industry is also exposed to volatility in prices of raw materials in international markets and risk of variation in foreign exchange rates.

Freight Subsidy: In addition to reimbursement of difference in cost production/imports of fertilizers and the sale prices, government separately reimburses freights as primary (to rake points) and secondary freights for movement of fertilizers to retail points. The rates of freight are not updated in time which delays the recovery of freight cost. There is also under recovery of freight



There is a fixed subsidy on phosphatic and potassic Fertilizers under NBS policy. This segment of industry faces unfair competition from imports due to same level of custom duty on raw materials and finished products.

Delayed Payments

In addition, to all the draw backs of policies, industry faces an additional road block in its smooth operation. The subsidy and freight dues as determined by the government are not paid in time. This happens due to inadequate allocation of funds for Fertilizer subsidy year after year and/or due to cumbersome and complex payment procedures even when funds are available. There are a variety of certifications required from state governments and retailers to get full dues from the government. At any given time, payments of the order of Rs. 35,000-40,000 crore are stuck with the government. This starves the industry of its working capital and pushes up interest cost of the industry due to heavy borrowing.

Impact of Fertilizer Policies

Unattractive Sector for Investment: Due to such a complex and stifling regulatory environment and micro management of industry by the government, the sector has been rendered unattractive for investment. There has been no new Fertilizer plant in the country for last 15 years. Capacity utilization of complex

Fertilizer plants has been low for last few years. It was a low of 63 per cent in 2014-15. This is due to unfair competition from imports. Level of custom duty is same for inputs and finished products. Urea plants, in spite of achieving high level of production are in poor financial health due to under recovery in costs under prevailing pricing policy. Industry on its part has been asking for reforms in the sector. Government has also stated its commitments inside the parliament to bring reforms in the sector. But there has been no progress after introduction of nutrients based subsidy (NBS) policy for P&K fertilizers in 2010.

Distorted in Prices of Fertilizers:

The most important negative impact of policies is that status quo is hurting the Indian soils and farmers the most due to imbalanced use of primary nutrients N,P & K. The present pricing policies have created a huge distortion in retail prices of various fertilizers. The price of urea remains stagnant at Rs. 5,360 per tonne but prices of complex fertilizers have increased by more than 100 per cent since 2010. The prevailing retail price of the flagship product Diammonium phosphate (DAP) is in excess of Rs. 22,000 per tonne. Thus the ratio between urea and DAP price is 1:4 which ideally should be 1:2. This has happened because government has been increasing subsidy on urea but lowered the subsidy on complex fertilizers.

Imbalance Use of Fertilizers

This has led to excess use of urea and distortion in use of NPK which was 6.8:2.4:1 in 2014-15 as opposed to a desirable ratio of 4:2:1 (Table 4).

Table 4: Fertilizer Consumption and NPK use ratio

Year	N	P ₂ O ₅	K ₂ O	Total	NPK use ratio
Million tones					
2009-10	15.58	7.27	3.63	26.49	4.3:2.0:1
2010-11	16.56	8.05	3.51	28.12	4.7:2.3:1
2011-12	17.30	7.91	2.58	27.79	6.7:3.1:1
2012-13	16.82	6.65	2.06	25.54	8.2:3.2:1
2013-14	16.75	5.63	2.10	24.48	8.0:2.7:1
2014-15 (Estimated)	17.01	6.08	2.50	25.60	6.8:2.4:1

The government has also recognized in its Economic Survey 2014 that there was an excess use of 5 million tones of urea in 2013-14. This is a sheer wastage of money by the farmers and also tax payers money in form of subsidy on excess urea. Industry is suffering as explained above due to faulty policy environment and government is finding it more and more difficult to budget for ever increasing subsidy bill. Most important it is affecting the soil health adversely.

Way Forward

The salvation lies in reforms. As a first step, Urea can also be brought under NBS policy with fixed subsidy and open MRP. The quantum of subsidy can be calibrated in a manner to promote

balance use of N,P, K and micro-nutrients. As long as government provides subsidy on mineral fertilizers, it should also provide support to organic fertilizers like city compost, farm yard manure, etc. in the interest of soil health. Ultimately the industry should be decontrolled and subsidy be paid directly to the farmers. With penetration of technology in form of Aadhaar Cards, Jan Dhan Bank accounts and Kisan Credit Cards, it should be entirely possible that subsidy is paid through cash transfer to farmers in next 2-3 years.

In view of the importance of Fertilizer and food security, 'Make in India' policy of the present government and more importantly massive subsidy involved, government should extend a

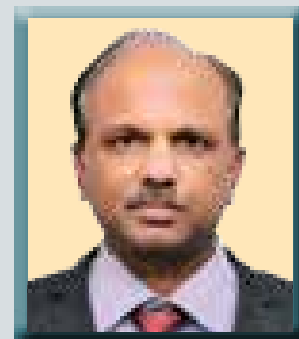
helping hand to the industry in putting up joint ventures abroad. Government should also provide level of playing field to domestic industry by reducing import duty on imported raw materials like rock phosphate, sulphur, phosphoric acid, ammonia and natural gas.

Conclusion

Present pricing policies have led to imbalanced use of plant nutrients, stagnant production capacity, poor health of existing industry and large Fertilizer subsidy. Government should act only as facilitator for investment and regulator for the sector. Industry needs to be freed from stifling controls and be allowed to operate in competitive environment. Instrument of subsidy should be used to increase agriculture productivity and economics of farming. Given the past performance and present strength of the indigenous industry, it can make the second largest Fertilizer consuming country completely self-sufficient in meeting the demand of fertilizers. Liberalized economic environment will help the industry to bring innovation in products and services benefitting the Indian farmers and agriculture. ■■■



Fertilizer - Urea scenario in India



Samudrala Venkateswar
CMD, PDIL

Timely and quality availability of nutrients to the crops are essential for food security of the country. Thanks to the early planning after independence, the green revolution has increased the food grain production in India and thereby the growth of fertilizer industry in India. The basic nutrients necessary to crops are NPK- Nitrogen, Phosphorous, and Potash. Major share of Nitrogen is provided through UREA. Lack of sufficient raw material, feed stock is the major hindrance in achieving self-sufficiency in fertilizers in India. As of now 75% of the Nitrogenous Fertilizers (mostly UREA) is met through indigenous production, Phosphorous fertilizers around 50% is met through import of raw materials i.e. rock phosphate, sulphur, intermediary production i.e., phosphoric acid, sulphuric acid and final finished product, the mix varies based on the financials. Potash is 100% import dependent.

The production, imports and consumption of nutrients for the year 2013-14 are as below:

Nutrients	Production	Imports	Consumption
Nitrogen	123.78 LMT	38.08 LMT	165.25 LMT
Phosphorous	37.14 LMT	15.90 LMT	54.58 LMT
Potash	Nil	13.33 LMT	19.76 LMT

Urea Production

The first plant for production of Urea started in India through Sindri Fertilizers Limited at Sindri in 1959. The installed capacity of urea in India as on date is around 224 LMT (30 production units). As per the annual report of Dept of Fertilizers, the capacity in PSU sector is 68.94 LMT, Cooperative sector is 64.37 LMT and 90.24 in private sector. During the year

2013-14 the production of urea has been 227.15 LMT and Imports were 70.88 LMT and in the year 2014-15 the same is around 225.85 LMT production and 87.49 LMT of imports. Thus, the gap in urea production is currently around 7 to 8 mmtpa. It is projected to increase in the years to come.

The gap is being met through Imports of Urea. The Gap is likely to increase in the future. Urea

has been a regulated commodity in India. The viability for manufacturing urea is dependent on the Investment and Pricing policies of the Government and feed stock availability and feed stock tie-ups.

The pricing and investment policies of GoI from time to time are briefly explained below:

- Retention pricing scheme (RPS) was introduced in the year 1977 which was a major shift in policy initiative which existed for a long period and improvements thereafter were rooted in the RPS. As per RPS, the retention price of the urea for each urea manufacturing unit was fixed. The difference between the retention price and the realization price from

farmer is given as Subsidy to the manufacturing units. Over the years the subsidy outgo from the Government increased manifolds due to Increase in Production, Increase in cost of feed stock, Increase in other input costs, Salaries and other Overheads. It was felt that Efficiency was not being encouraged in individual plants as the Retention price was being fixed for each unit individually based on the historical costs of the respective units.

- In order to encourage efficient production and also to rationalize the subsidy outgo, the retention pricing scheme was replaced by New Pricing Scheme (NPS) wef April 01, 2013. Here all the urea manufacturing units were grouped into 6 groups like pre 1992 gas based units, post 1992 gas based units, pre 1992 naphtha based units, post 1992 naphtha based units, FO/LSHS based units and mixed energy units. The prices were fixed for each of the group as against individual units. The NPS was introduced in three phases. NPS-I (2003), NPS-II (2004) and NPS-III (2006) by setting normative energy norms for each phase and also insisting the units manufacturing urea through feed stock other than Natural Gas to shift to Natural Gas.

- At present, the NPS-III as modified is in operation for the existing units.

- The above policies of GoI induced the existing Fertilizer companies to go for Capacity enhancements, Feed stock conversions, Energy Saving measures. The Installed capacity of Urea in India had increased mostly through above measures and also due to the older plants having potential



capacity which often termed as GOLD PLATED CAPACITY which was reassessed. However neither Green field nor Brown field urea plants were set up in India for the past more than 18 years. Non availability of Natural Gas, increasing price of imported LNG and the lack of inducement in the form of encouraging investment and pricing policy of urea were the major reasons for lack of investment in Green field and brown field projects in urea. The industry was engaged in revamps, feed stock conversions and energy efficiency schemes during the period.

- Even as on date, the total allocation of Natural Gas to fertilizer industry is around 31mmscmd as against the present requirement of around 42mmscmd. The gap is being met through imported LNG through long term contracts/spot procurement.

- NIP 2008 was announced to encourage investment for new urea plants in the country. The price of

urea was linked to Import Parity price (IPP) and a floor and ceiling was defined. However the same was not able to attract new investment mainly because of non availability of domestic gas and variation in price of Imported LNG and the investment policy not giving comfort for compensating increased imported gas price.

- After much churning, the New Investment Policy for urea (NIP 2012) was notified in January 2013. The prices were linked to IPP and formula for variation in the set price due to increase in feed stock price was well defined. Floor and Ceiling prices of urea was set up guaranteeing post tax return of 12 percent to 20 percent. For example in case of Green field units the floor and ceiling was defined at USD 305 – USD 335 at a gas price of 6.5 USD/mmbtu and for every one USD increase in Gas price, the floor and ceiling shall increase by USD 20 up to the gas price of 14 USD/mmbtu and later

on only the floor price increases. Encouraged by the policy, almost more than 12 proposals were submitted to the Government mostly for expansion projects. However, the proposals were kept pending in view of certain amendments mooted in the NIP 2012. The amendment to NIP 2012 was notified in October 2014. The guaranteed buyback clause was replaced by the clause of payment of subsidy on sale of urea. In addition to attract only serious players a Bank Guarantee of Rs 300 Crores was incorporated for going ahead with the proposals from private players. Though still almost all the Fertilizer majors have proposals for going ahead for expansion projects, so far no proposal was concluded to the stage of start of construction activities.

- Another policy initiative announced recently is the Gas Pooling System for pricing of natural gas for existing units as well as proposed units. The same was notified vide GoI notification dated 20th May, 2015. The mechanism of fixing the pool price and operation of the same is detailed therein. The same is effective from 1st July, 2015. The gap of indigenous Natural Gas was to be met through Imported LNG through



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Contracts/Spot purchases.

- For the existing urea manufacturing units, GoI had announced another round of energy efficiency targets to be implemented by the units over a period of 3 to 4 years from now in an order to

increase efficiency and reduce subsidy burden.

- Neem coating of urea is now made compulsory. The objective is to improve crop yields and also prevent diversion of urea for industrial uses.

Present imported Urea price is hovering around USD 300. However the Cost of production of any proposed new urea manufacturing unit as on date is envisaged to be much higher than USD 300. There are talks in the media that the availability of Urea internationally is also likely to increase with increasing capacities which are at various stages of implementation. There are also thinkers who advise import of urea as against importing costly feed stock and producing urea at higher costs than importing the finished product. Moreover, delays in implementation of new projects are bound to increase the cost of the projects. The scenario of urea availability and pricing 4 to 5 years hence again dependent on the proposed capacity expansion in India both being inversely related making decision making complicate.

New Projects under active consideration:

Coal is also considered as alternate feed stock for production of urea through coal as feed stock is also doing rounds. Almost entire urea in China is produced through coal route. However, due to higher ash content in Indian coal; there are technological challenges to be met for which continuous developments are on.

GoI is also keen to revive the closed fertilizer units of Fertilizer Corporation of India and Hindustan Fertilizers Limited. Ramagundum unit is being



revived by JV of NFL, EIL and FCIL. Talcher is set to be revived by JV of RCF, GAIL, Coal India and FCIL through Coal as feed stock. Besides announcements made for setting up of urea plants at Gorakhpur, Sindri and Barauni. GoI had also approved setting up of new urea plant at Namrup, Assam through a JV of BVFCL, OIL, Assam Govt and a private partner.

-up of importing finished urea. The OMIFCO established at OMAN was the first step in this direction and repeat of such ventures is always suggested. The present standard capacity ammonia urea plant is of 1.27 mmtpa (2200MTPD of ammonia and 3850 MTPD of urea). The likely capacity increase in India can be envisaged as below: Considering the objective of Self

essential. With the above the gap in production and consumption is bound to be bridged. Most of the projects mentioned above are in preliminary stage where interested investors need to come. The present policy pronouncements should encourage the industry in setting up of new urea units. Industry needs a comfort as to assurance of preference to indigenous production over imports

Sl. No.	Particulars	Remarks	Capacity addition (mmtpa)
1	Matix fertilizers, Panagarh, West Bengal	Based on CBM as feed stock (is in commissioning stage)	1.27
2	Talcher project	Through Coal gasification route (JV of RCF,GAIL, Coal India & FCIL)	1.27
3	Ramagundum project	Thru JV of NFL and EIL	1.27
4	Brown field expansions	13 Proposals are mooted. (assuming 1 to 3 projects materialize)	3.81 (1.27X 3)
5	Green field (revival of closed units)	Gorakhpur, Sindri and Barauni are in the news.	3.81 (1.27X 3)
6	Namrup- IV		0.864
7	Urea plant as a JV in foreign land with import tie up.		1.27
	Total Probable Capacity		13.564

Also suggestions are made to set up urea manufacturing units in countries where Gas is cheap through JV's with tie

reliance, Capex and Opex and alternate feed stock use and the overall economics of the projects, probably a mix of all above is

and timely release of subsidies and a variation formula in the floor and ceiling for other costs also. ■■■



Government shows the Vision & Intent, While basics still needs attention



R. Mukundan

Managing Director, Tata Chemicals Ltd.

“Government wants to produce more Fertilizers in the country and reduce import dependence. The Ministry of Chemicals and Fertilizers is working on the Prime Minister’s ‘Make in India’ mantra and in this regard several old and sick units are being revived”

Mr. Ananth Kumar

Union Minister for Chemicals and Fertilizers

This vision of our Honorable Prime Minister and our Minister for Chemicals and Fertilizers gives the fertilizer industry the direction and goal, to achieve self-sufficiency in production.

Recent measures taken by the Government of India have provided an additional impetus to the industry, particularly the decision on gas pooling. Through gas pooling, the Government of India aims to incentivise competition on the basis of the cost structure of individual units, which will now depend primarily on energy efficiency. The policy lays the responsibility of profitability on the energy efficiency and production volumes of individual players. It is expected to positively impact those players, who did not have access to low cost domestic gas

and were operating using largely RLNG.

Another encouraging policy boost for the industry was the New Urea Policy 2015, which aims to increase urea output, lower imports, reduce subsidies and the carbon footprint of the urea industry over the next four years. The policy outlines measures for boosting urea production by making plants more energy efficient through the pooling of gas supplied to urea facilities. For the Fertilizer industry, while this is a step in the right direction, at the same time, it is extremely challenging for the individual players to be more energy efficient.

To realise the full potential of the new policies and bring in a holistic and sustainable growth for the industry and increase agricultural productivity, there are a number

of key issues which need focus. In order to revive the industry and to ensure self-sufficiency in the domestic manufacture of urea, we need to make the sector attractive for investors, and create an environment that propels technological advancements while incentivising industrial compliance with environment conservation. Larger issues such as inclusion of urea in the Nutrient-Based Subsidy Scheme and rationalisation of increases in urea retail prices, must be addressed.

Low urea pricing continues to create a deep rooted negative impact

One of the major issues the Government has not yet addressed is the selling price of urea. The continued gap between the prices of urea vis-à-vis phosphatic

and potassic Fertilizers, is responsible for the skewed use of plant nutrients. The high prices of non-urea Fertilizers has led to excessive and indiscriminate use of urea (main source of nitrogen) and has substantially reduced the consumption of DAP, NPK and MOP, which are important sources of potassium and phosphorus. As a result, the current NPK use is heavily tilted at 8.3:2.4:1 as against the ideal ratio of 4:2:1. The excessive use of lower-priced urea, in the absence of adequate application of other Fertilizers, is causing widespread soil degradation and pollution of water and air to the detriment of crop productivity and human health. Moreover, prime agricultural soil across the country is turning deficient in not only major plant nutrients like phosphorus and potash but also in other vital nutrients like sulphur, zinc and boron.

Further, at Rs 5,360 per tonne, the current MRP of urea in India is significantly low compared to the prices in neighbouring countries. This low price is also the reason for diverting of urea to industrial use, smuggling to neighbouring countries and black marketing. Out of the total consumption of urea that amounts to about 31 million tonne (2014-15), a substantial portion (30 per cent as per estimates) is diverted for industrial use.

Rising Fertilizer subsidy and delayed payment continues to strain the industry

While there has been a perpetual control on the MRP of urea, on the other hand, there has also been a steep increase in the price of feedstock and other inputs,



apart from the increase in the cost of imported urea. Due to which, the Fertilizer subsidy has grown by leaps and bounds. According to expert estimates, the subsidy on urea has increased from Rs 5,800 crore in 1992-1993 to Rs 43,000 crore in 2014-2015.

The rising subsidy bill with no significant increase in agriculture productivity indicates that inefficiencies in the mechanism are impacting farmers, fertilizer manufacturers, as well as taxpayers and consumers.

Furthermore, there has been an ongoing delay in clearing the subsidy bills by the successive Governments. The industry has been in a severe liquidity crisis in the last 3-4 years primarily due to inadequate budget provisions year-on-year. The delay in subsidy payments has huge implications on the operations of urea firms. According to experts, lesser number of companies are interested in setting up urea manufacturing units and hence no new capacity has been added in the past 13 years due to lack of an appropriate policy framework. This has resulted in the widening

of the demand-supply gap. While the domestic production of urea has stagnated at 22 million tonne, the current consumption is around 30 million tonne, implying 8 million tonne of imports. The limited availability of domestic gas has also led urea players to depend on costly imported gas for production.

Stagnant investment has taken the sheen out of the industry

A highly regulated and controlled regime over a long period has made the Fertilizer industry financially unviable. Since 1999, no new plant has been commissioned to manufacture urea due to uncertainty in the pricing structure. In some cases, this regime resulted in the shutdown of some plants leading to a reduction in capacity. Due to negligible capacity additions, dependence on imports has increased significantly.

The Fertilizer industry plays an important role in ensuring food security of the country. To ensure food security, there is need for self-sufficiency in domestic production of Fertilizers, particularly, urea.

Inclusion of urea in NBS will enable a balanced solution

Recently, the Comptroller and Auditor General observed that no significant investment was made in the Fertilizer sector to increase either the number of Fertilizer plants or their installed capacity, during 2010-14 period even after the launch of Nutrient Based Subsidy scheme to promote the domestic industry. One of the major reasons was non-inclusion of the present subsidy regime is skewed heavily in favour of urea, leading to its imprudent and unabated use. Therefore, there is a need to decontrol urea prices and bring them at par with the prices of P&K Fertilizers to maintain NPK balance. The stated NBS policy of the government which is applicable only to P&K Fertilizers needs to be extended for urea also.

Inclusion of urea in NBS will be a step in the right direction. It will not only help in achieving a balanced nutrient consumption but also improve the government's finances. The policy will enable more transparency and investments into the sector. There had been no fresh investments in the sector for more than a decade due to uncertainty in the pricing structure.

Subsidies undoubtedly have played a significant role in promoting Fertilizers but they have been questioned in recent years due to their declining contribution, inequity and government's expanding budget deficit. The need of the hour is to move towards an environment for holistic development of the sector with the goal of achieving efficiency and self-sufficiency.

Balanced crop nutrition through customized Fertilizers

Balanced nutrition is essential to increase the productivity of the soil in India. While the government is trying to implement the usage of soil health cards, it is right time to recognize the important role customized fertilizers can play. A balanced use of nutrients can reduce the amount of fertilizers being applied to the soil by almost 80 per cent, thus reducing the cost of application as well as increasing the yield by 25-30 per cent, on average.

Customized fertilizers has been a major innovation of last decade in India for promoting balanced use of fertilizers. The customisation is done after conducting scientific research to find nutrients deficient in a particular soil for growing specific crops. The fertilizers are then prepared with the deficient nutrients in that soil rather than standard fertilizers for all soil types. Developed on the basis of soil, crop and water sample analyses, they help correct nutrient imbalance in the soil caused by prolonged inadequate and indiscriminate use of fertilizers.

While the usage of soil health cards will enable crop-wise recommendations of nutrients/fertilizers required for farms, making it possible for farmers to improve productivity by wisely using inputs, the availability of customized Fertilizers will be key. However, considering that there is inadequate policy support for customized Fertilizers, the adoption of the same is getting impacted and the farmers are being devoid of choices.

But even as the Fertilizer industry continues to contribute to increase agriculture productivity, it finds itself in a rather unfortunate and untenable situation as the current trends depict that the marginal productivity of soil is declining as compared to the application of Fertilizers. Moreover, the industry has not been able to free itself from the clutches of regulation.

The removal of government controls on manufacturing and distribution of fertilizers will go a long way and allow the growth of the industry. In the era of globalization, market oriented policies will not only facilitate use of efficient product but also educate farmers about its benefits in the long run.

Sustainable production can only be achieved through adoption of site-specific balanced and integrated nutrient management involving major, secondary and micro nutrients, organic manures, bio-fertilizers and amendments. Thus, there is a need to utilise all indigenously available nutrient sources to reduce dependence on imports; develop new efficient fertilizer products and create awareness among farmers on benefits of integrated nutrient management.

The three critical cornerstones impacting this industry viz. improving soil health, support to the needy farmer and rationalising Fertilizer subsidies are all inter-woven. One needs to take a holistic view of the same and move forward to ensure this sector can flourish and contribute to the food security of the nation. ■■■

Opportunities and Challenges in Fertilizer Sector



Manoj Mishra
CMD, NFL

Food security is of immense importance to meet the growing food needs of an ever increasing population of India. To meet the burgeoning demand of food requirement of 1.25 billion population is a challenge, which can only be met by augmenting domestic production of food grains.

The importance of agriculture can be further understood from the fact that the agricultural output still contributes about 17 percent of the country's GDP and nearly 60 percent of population derives its livelihood from it. Moreover, Industry and services sectors too depend heavily on it for their rapid and sustained growth. Therefore, agriculture needs to grow rapidly not only for ensuring food security but also for giving a boost to economic growth.

The growth of agriculture, inter alia, depends on supply of much needed primary plant nutrients viz., N, P&K and a host of secondary and micro-nutrients. For this, it is important to ensure that a regular supply of fertilizers containing primary and secondary is made available to farmers at an affordable price.

Opportunities

India is meeting 75 percent of its urea requirement through indigenous production but is largely import dependent for its requirements of phosphate and potassic (P&K) fertilizers. Its entire potash requirement, about 50 percent of phosphatic requirement, and 25 percent urea requirement is met through imports.

Since the land area under cultivation is decreasing along with decrease in average size of holding, the growth in agriculture can only be achieved by substantially increasing productivity of land. For getting maximum crop yield from fertilizer use and yet maintaining soil health, it is imperative to apply three major primary nutrients N, P&K in the right mix.

The government is encouraging the industry to develop and market newer formulations which would be customized to specific regional soil and crop requirements. Since subsidy would be accorded on nutrient basis, fertilizer units developing new formulations will be able to price the products based on demand.

To get maximum crop yield from fertilizer use and maintain soil health, it is imperative that NPK ratio is maintained at 4:2:1. But, the diverse pricing mechanism of different fertilizers has led to increasing imbalance and the ratio has gone to 8.2:3.2:1. The problem of imbalanced fertilization can be addressed through customized fertilizers to some extent. Fertilizer companies can set up small production units spread across their marketing territory to manufacture customized fertilizers based on requirement of nutrients specific to a particular soil and crop. In this regard, companies can make use of soil maps already developed and are available publically.

The Government has recently announced various policies to set up new Urea plants, maximize production from the existing capacities, manufacture of fortified fertilizers, and optimization of energy consumption of the plants.

Government under "Make in India" theme is promoting domestic production of Urea and encouraging the industry to revive the closed Urea plants / set

up new Urea plants under remunerative New Investment Policy - 2012. One step towards this endeavour was introduction of gas pooling under which all the Urea manufacturers across the country are being delivered the gas at a uniform price. Further, from 2018-19 onwards, pooling of gas is being made applicable for new Brownfield/Greenfield units.

Under New Investment Policy 2012, the policy benchmarks realization of urea for new projects to import parity prices, subject to floor and ceiling, which are in turn linked to gas prices. Further, it provides downside risk protection through floor price mechanism (minimum implicit ROE of 12 percent) and upside benefit through import parity price linked ceiling price mechanism (with maximum implicit ROE of 20 percent). The policy coupled with pooling of gas has made investment in urea sector remunerative.

With the implementation of New Urea Policy-2015, coupled with the implementation of Gas pooling, the Government is also encouraging industry to maximize the Urea production beyond re-assessed capacities from the plants which were revamped by the companies.

The new guidelines shall certainly reduce the dependence of the country on Imports and save foreign exchange.

Further, the basic premise of the New Urea Policy - 2015 is based on incentivizing the companies to produce Urea at lower energy consumption. Industry, therefore, can capitalize on this aspect by saving energy consumption through additional investment on energy saving schemes and



optimum operation of the plants.

Currently, India is importing Di Ammonium Phosphate (DAP) and Murate of Potash (MoP) because of non-availability of raw material for these fertilizers. An opportunity for the Fertilizer Industry exists for setting up manufacturing plants under long term buy back arrangement of DAP & MoP in countries where raw materials are available in abundance. Thus, there are opportunities to set up fertilizer plants outside India in Joint Venture mode.

The manufacturing of Single Super Phosphate (SSP), being the cheaper phosphate fertilizer available to the farmers, may be promoted and some big scale plants may be set up by the companies to meet the requirement of this fertilizer. Currently, SSP is being manufactured largely by small players and quality of the product is an issue which needs to be addressed through stringent quality compliance.

Apart from above, Fertilizer Industry has ample opportunities in other specialized fertilizers like Fortified & Water Soluble

Fertilizers. Fertilizer Companies can broaden their product offering with these special fertilizers.

The Government is also planning to transfer the subsidy directly to the bank accounts of farmers, instead of routing through manufacturing/importing companies as per existing system. Direct Benefit Transfer (DBT) to farmers under Mobile based Fertilizer Monitoring System (mFMS) will help the industry in tiding over the problem of liquidity crunch.

Challenges

There are many challenges / issues which fertilizer industry is grappling with today. These issues require to be addressed in order to improve the economic viability of operation of fertilizer plants.

During the previous one-and-a-half decade, there has been hardly any investment made for adding to indigenous urea production capacity. The stagnant growth in fertilizer sector is majorly attributed to delay in notification of remunerative investment policy by Government, inadequate availability of raw

materials like natural gas, phosphate rocks etc. and inadequate subsidy allocation in budget by the Government.

The decreasing trend of Urea price in International market due to adequate availability of gas at cheaper prices abroad is still a cause of concern to the domestic Industry as investment in new plants and additional production beyond re-assessed capacity would be driven by the prevailing International price of Urea.

In order to ensure level playing field for domestic producers, Government will have to address the above challenges on priority. The availability of fertilizers in the country could be improved by setting up Joint Ventures abroad where input prices are comparatively very low and fertilizers produced in the countries may be procured under long term buy back arrangement.

Fertilizer Industry is currently facing severe liquidity crunch due to delay in receipt of subsidy from Government. This situation is expected to turn severe in future with the growth in fertilizer consumption and almost stagnant Urea prices since last many years. Due to significant delay in release of Fertilizer subsidy, industry is bound to be dependent on huge borrowings to manage working capital requirement. The industry is experiencing double whammy in terms of interest being incurred on the huge capital investment required to revamp the plants for energy saving schemes and borrowings to manage the working capital due to delay in receipt of subsidy. This issue can be addressed through realistic allocation in the budget for the fertilizers and regular



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increase in Urea prices consistent with the inflation.

The imbalance in fertilizer use is another major challenge because different policy dispensations for decontrolled P&K fertilizers and urea are working at cross-purposes with each other. This has skewed NPK fertilizer use ratio towards urea. Increasing disparity between Urea and P&K fertilizer prices needs to be balanced and their relative price ratios can be brought to desired level for promoting balanced fertilization. It will also benefit farmers by improving returns from fertilizer use with rationalized use of fertilizer nutrients.

The declining trend of Urea prices

in international market is posing a great threat to the domestic producers of Urea as additional production beyond cut-off quantity from the revamped capacity may not be economically viable in the event of dip in the international price of urea from the existing levels.

In addition to above, the adequate availability of Neem oil for manufacturing 100 percent Neem Coated Urea could be a challenge to the Industry after the recent Government notification which makes it mandatory for companies to manufacture 100 percent of Urea as Neem Coated Urea.

The environmental damage caused by the imbalanced use of fertilizers is a matter of serious concern in many states. The biggest issue facing the use of chemical fertilizers is groundwater contamination. Nitrogenous fertilizers break down into nitrates and travel easily through the soil. Because it is water-soluble and can remain in groundwater for decades, the addition of more nitrogen over the years has an accumulative effect. Here the challenge is to change the pattern of fertilizer use. This not only involves revamping and re-energizing the extension services but also rationalizing the existing fertilizer policies suitably to remove the price distortion caused by it.

These are the major challenges faced by the fertilizer industry which need to be addressed. Production of fertilizer being highly energy and capital intensive, in an inflationary environment, its cost is unavoidably high. The need of the hour is to maintain an appropriate balance between pricing of fertilizers and subsidy. ■■■

Opportunities and Challenges

in the Fertilizer Sector



Dr. S. K. Nanda, IAS
CMD, GSFC

Fertilizer Sector Overview

Agriculture mediates between nature and the human needs, with ties and obligations in both directions. Despite the focus on industrialization, agriculture remains a dominant sector of the Indian economy both in terms of contribution to Gross Domestic Product (GDP) as well as a source of employment to millions across the country. It plays a vital role in the Indian economy. Over 70 per cent of the rural households depend on agriculture as their principal means of livelihood. As per the estimates released by Central Statistics Office the total Share of Agriculture & Allied sectors such as agriculture, livestock, bio-fuels production, and fishery sub sectors in terms of percentage of GDP is 13.9 percent during 2013-14 at 2004-05 prices.

There are multiple factors that have predominantly worked harmonically leading to the growth of the Indian agriculture sector in recent years. These include growth in income and consumption, growth in food processing sector and increase in agricultural exports. Also, increasing private

participation in Indian agriculture, growing organic farming and usage of fertilizer technology are the trends that are being witnessed by the flourishing agriculture industry. Amongst all, fertilizer has emerged as one of the key inputs in increasing productivity in agriculture of India. Growth and development of agriculture in India derives a significant stimulus from the fertilizer industry. Fertilizer consumption in India has been increasing over the years and India today is one of the largest producer and consumer of Fertilizers in the world.

The Indian Fertilizer Industry is one of the allied sectors of the agricultural sphere. India has emerged as the third largest producer of nitrogenous fertilizers. The supply of fertilizers is met both by domestic production and imports. The factors driving fertilizer demand include continued population growth, increased income, diet diversification, bio-fuels development, limited availability of arable land, increased recycling of organic nutrient sources and improved nutrient use efficiency. In order to ensure

self-sufficiency in food grains production in the country, availability of fertilizers at affordable prices to the producers is of utmost importance.

At present there are 57 large scale fertilizer units. These manufacture an extensive range of nitrogenous, phosphorous and complex fertilizers. Out of these 57 units, 29 are engaged in the manufacturing of urea, while 13 of them produce Calcium Ammonium Nitrate and Ammonium Sulphate. The remaining fertilizer plants manufacture complex fertilizers and DAP. There are also about 72 numbers of medium and small scale industries in operation. Overall, the consumption of fertilizer has shown a persistent upward trend. The table below shows the growing demand of fertilizers in the forthcoming years. The increasing demand of all these variants of fertilizers have to be met by indigenous production and the surplus quantity will be required to suffice through imports. This anticipated requirement reflects a wide scope for capacity enhancement of existing plants along with set in of newer plants.

**Table 1: Demand Forecast of Fertilizer Products for India
(in Thousand Tones)**

Year	Urea	DAP	NP/NPK	SSP	MOP
2015-16	32858	12212	11142	5513	4643
2016-17	33677	12413	11420	5948	4193
2017-18	33754	12164	11841	6416	4934

The factors of prime concern influencing the fertilizer industry supply include energy prices, government trade policies and environmental concerns. It is not only important to meet the emerging challenges of ensuring food and nutrition security in agriculture but also mitigating the unwanted impacts on the environment.

The fertilizer sector is rendering the responsibility of fulfilling the human needs with enhanced agriculture produce along with undertaking a number of initiatives foreseeing the wide horizon of opportunities.

Debottlenecking of Plants

Increased and modernized fertilizer production capacities to reduce environmental footprint at production sites. The move towards higher capacity plants helps to implement more efficient technologies as capacity upgrades offer a cost-effective opportunity to install better performing technology and reduce unwanted emissions.

Inculcating Modernization

The Fertilizer plants have adopted diverse technologies supplied by various renowned licensors. This sector has achieved capability in designing, engineering and construction of the fertilizer plants. Several fertilizer companies have well equipped research laboratories which are engaged in

R&D activities in the area of catalyst, new and modified fertilizer products, including customized and fortified fertilizers, pollution control, effluent treatment, materials of conclusions, utilization of inferior quality rock phosphate, process modelling and simulation, etc.

Conserving Energy Resources

The standards have been developed for the promotion of efficient, safe and secure production, storage and transport of plant nutrients in a suitable manner and consequently performance measures have been in the increasing trend. The Indian fertilizer industry has recognition in the world in terms of operational efficiency, energy consumption, plant maintenance, industrial safety and environment protection. Ammonia & urea plants have demonstrated consistent reduction in specific energy consumption and thereby yielded conservation of natural resources.

Strengthening Policies

The encouraging government policies for production, supply and use of fertilizers act as a catalyst in the fertilizer sector. It has been the endeavour of the Government and the Fertilizer sector to make fertilizers available across the country, including the remote and inaccessible areas. Currently, there are about

275 thousand distribution centres across the country catering to the need for fertilizers. Various agroservices help stations have been set up by government agencies promoting the use of fertilizers providing solutions based on soil and crop needs. Widespread soil testing facility is provided so that the information about requirement of suitable nutrients for the soil could be availed.

Innovation at core

One of the recent facets of advancement in the field of fertilizer technology is Bio-fertilizer. The Bio-fertilizers are eco-friendly organic agro-input which add nutrients through the natural processes of nitrogen fixation, solubilizing phosphorus, and stimulating plant growth through the synthesis of growth promoting substances. Biofertilizers can be expected to reduce the use of chemical fertilizers and pesticides. Water Soluble Fertilizer marks another altitude reached in the field of development of fertilizers. These fertilizers acts as a nutrient carrier which dissolves quickly without leaving any undissolved residue & does not clog emitters, nozzles in drip, sprinkler irrigation system.

Epitomizing enhanced efficiency

Nitrogen derived from fertilizers and not taken up by plants are immobilized in soil organic matter or is lost in the environment from soil. In this case, it has the potential to become a pollutant of ground or surface waters or to contribute to the greenhouse effect. Enhanced Efficiency Fertilizers have been adopted to characterize products that can minimise the potential of

nutrient loss to the environment, as compared to reference soluble sources. Controlled-release fertilizers, which comprise coated, water insoluble products and stabilized fertilizers which are those amended with additives that reduce the transformation rate of fertilizer compounds, resulting in an extended time of availability in the soil. The products such as Neem coated Urea, Sulphur coated Urea, Polymer Coated Urea are developed retaining the nutrition of fertilizers in the soil and mitigating any harmful effects to the environment exemplify the consciousness of fertilizer sector towards greener Earth along with enhancing fertilizer efficiency.

Along with various benefits and huge scope of advancements there are some challenges which are faced by the fertilizer sector. The significant risks and opportunities that climate change present for agriculture, food supplies and the global fertilizer industry, create an imperative for the industry to contribute to the mitigation and adaptation in the context of achieving a more sustainable path towards food security.

Meeting the demand

Many times the government is faced with the piquant situation, which demands a balance between the needs of the farmers and the fertilizer manufacturers. The challenges before the Indian fertilizer industry relate to the incertitude in the supply of fertilizers. There has been a surge in the demand for fertilizers in the past few years. Good monsoonal showers have led to the growth in agriculture, inadvertently increasing the consumption rate of fertilizers. However, the robust growth in consumption



propensity has not been met with the required increase in fertilizer production. This has widened the gap between the demand and supply of fertilizers, which has led to an increase in the dependence of the country on imports. This also reflects on the lack of realizing of the domestic capacity utilization of the reserves in the country.

Managing raw materials stock

Another important factor that has led to the stunted growth of the fertilizer industry is the rise in prices of the feedstock. The fertilizer industry is dependent on gas for the production of urea and phosphoric acid for the production of phosphorous fertilizers and DAP. India is meeting 80 percent of its Urea requirement through indigenous production but in case of phosphorous and potassium fertilizers it has to be dependent on imports either as finished fertilizers or raw materials like rock phosphate, sulphur, phosphoric acid and potash. The country imports its inputs from other countries. Its entire potash requirement, about 90 percent of phosphorous requirement and

20 percent of Urea requirement is met through imports. About 90 percent requirement of feedstock i.e. Ammonia for manufacturing of nitrogenous fertilizers can be met by domestic sources and about 10 percent is met by import. The overseas suppliers of raw materials realize the predicament of the Indian fertilizer industry and have started exploiting the shortage through clever pricing. The need arises for fertilizer sector to adequately manage the required feed stock in advance to overcome any stringent scarcity and supplement smooth running of plants.

Revival at the earliest

The small size of the older plants also poses as drawbacks of the industry. Recent policies of the government are directed towards revamping of these industries and restoring them to health. The fertilizer industry is faced with other challenges as infra structural bottlenecks and the uncertainties in government policies. The delay in decision making and obscurity in setting parameters are among some of the major drawbacks of the government policies directed towards the industry. To retrieve

the health and growth of the fertilizer industry, the government of India is in need of long term realistic policies that would enable the industry to overcome the challenges and survive the present impasse.

Rising Subsidy Burden

The government of India ensures supply of fertilizer to the farmers at reasonable rates. The retail prices of fertilizers are significantly lower than the cost of production/imports by passing on subsidy to the producers and importers. The subsidy burden on government remained in rising trend due to increasing cost of production/imports. The government has introduced policies to decontrol the prices but delayed the implementation of the parameters that have not augured in favour of the industry. As a result, the subsidy burden for the year 2014-15 was about Rs. 70000 crores.

The Right Way Forward

For fertilizers to become mainstay, simple selling or producing does not address the issue. The soil health and required nutrient determination is the first step. Looking to this phenomena, GSFC came forward with Sardar Agri Package which believes in (a) Save Energy, (b) Save Water,



(c) Save Fertilizers - Solarisation. Use of Micro Irrigation sets and shifting to WSF would be the pattern tomorrow. Subsidies if any have to follow this route and the farmers would get relieved by getting right value for their land and labour costs and that would balance the skewed Fertilizer ratio and take forward the saga of agriculture by giving more of attention and monetary help to farmers to take up these sets and practices to revolutionise their agriculture.

Conclusion

With the limited arable land resources and burden of increasing population, the development of new technologies and efficient

use of available technologies will continue to play an important role in sustaining food security in India. The Government of India has, been consistently pursuing policies favorable to increased availability and consumption of fertilizers in the country. Overall, a conducive and stable policy, environment friendly production processes, availability of raw materials, capital resources, and price incentives will play a crucial role and strengthen the initiatives to meet the Fertilizer requirements of the country. The growth trajectory of the Indian fertilizer industry has camouflaged the impending challenges and succeeded in meeting the demand of all chemical fertilizers in the recent years.



Fertilizer Industry: A Beacon of Light



Jaiveer Srivastava

CMD, FACT

Global food demand is bound to increase, so are the challenges to keep masses out from hunger. The role of chemical fertilizers in increasing the agricultural production and catering to food for masses cannot be denied. Fertilizer serves as the key ingredient for the food security of the country, by increasing the production and productivity of the soil.

The Indian domestic food grain production target set at 320 million tones in the coming years, from the present production of 261 million tones, can only be achieved by higher productivity through improved farming practices with the adoption of balanced use of fertilizers, coupled with expansion of irrigation, and use of quality seeds. The Indian fertilizer industry, in the past 68 years has grown in size and stature and it now ranks third in the world's fertilizers production, next to USA and China.

Rising energy costs, volatility in raw material prices, scarcity of raw materials, environmental pressures, frequent changes in the fertilizer policy etc are the major issues affecting the viability of Fertilizer industry.

The Indian Fertilizer Industry is

one of the most energy intensive sectors. As there is increasing productivity through the implementation of competent and pollution free technologies in this sector it would be appropriate to include economic, environmental and social development objectives, for enhancement of efficiency .

Energy efficiency in Fertilizer industry

As per the analysis of Bureau of Energy Efficiency (BEE), Fertilizer Industry is considered as one among the energy intensive '8' industrial segments in India. It is categorized as "RED" by the Ministry of Environment and Forests on the basis of its environmental impact. Ammonia-Urea production is included in the 'PAT' (Perform Achieve & Trade) scheme with an energy reduction performance improvement target for 2015 .

Ammonia is considered as the building block of nitrogenous fertilizer industry and is accountable for more than 80 percent of the total energy requirement of Fertilizer industry. Energy is one of the major component in the cost of production of nitrogenous fertilizers, especially Urea. Cost of energy component changes with

the type of feedstock, fuel and technology used for production. At present natural gas is the principal energy resource for creating ammonia.

Gas based Ammonia-Urea plants are minimum energy consuming, compared to Naphtha based and fuel oil based plants, with an average of 6.449 Gcal/MT of Urea (average of 27 domestic gas-based Urea units). In 2008, the overall energy consumption, in Indian Ammonia-Urea plants was 8.97 Gcal / MT. With expansions projects and practices for better energy consumption, the Urea industry strives to improve on the norms to attain the energy consumption standards of 5-5.55 Gcal / MT laid out in the New Urea Policy 2015. The New Urea Policy categories the 30 Urea units in three group of Energy consumption levels of 5-6 Gcal/MT, 6-7 Gcal/MT and more than 7 Gcal/MT .The policy incentivizes to cut energy consumption levels so that less energy efficient units improve operating efficiency.

Fertilizer being a subsidized product, with the tightening of the norms of Specific Energy Consumption, industry has to constantly endeavour to reduce the energy consumption in order



Innovations in Material handling and logistics: Barge transportation

to remain competitive as well as environment-friendly.

Industrial measures practiced in ammonia plants to improve energy efficiency include

- Replacement of process equipment with high - efficiency models.
- Improving the process controls to optimize chemical reactions.
- Recovering process heat.
- Minimizing the wastage/ maximize the recovery of waste material

Energy Efficiency in other areas of Fertilizer industry include

- Improving efficiency of Boilers and Captive power plants
- Variable Frequency Drive (VFD) for high capacity centrifugal pumps in process plants
- Optimising recycle ratio in complex fertilizer plants
- Improving energy for handling & transportation of raw materials/ intermediates/ finished products.
- Improving waste heat recovery

Increased energy efficiency, better

reliance on renewable energy and the use of cleaner technologies together bring economic, social and environmental benefits that can lead the country on a much-desired road to sustainable development.

Constraints in raw material availability

Considering the fact that India's present dependence on import is in the range of 25 percent for Urea, 90 percent for Phosphates, either as raw material or finished fertilizers and 100 percent for Potash, Government has been encouraging Companies to establish Joint Ventures in countries which are rich in fertilizer resources with buy back arrangements or to enter into long term agreement for supply of fertilizer inputs to India. (Ref Annual report DoF 2014-15).

For Nitrogenous Fertilizer industry, availability of Natural gas at affordable price will be the deciding factor for Indian Urea industry. In case of phosphates, the paucity of domestic raw material has been a constraint in the attainment of self sufficiency in the

country. In view of the diminishing traditional raw material reserves for phosphatic industry, long term planning for regular supply and tie ups for better bargaining power, Joint Ventures for raw material/fuel accessibility, shifting the focus from traditional boundaries to new horizons of supply like US, China, Russia, etc are the needs of the hour for Fertilizer industry. The potash industry provides a little leverage for buyers, and long term alliances, investments or stakes in new projects or enhancing existing operations, or being inert in an oversupplied market can be strategies adopted depending on the scenario.

Hence competitive issues, policies and economics will be the deciding factor in the survival and sustenance of Fertilizer sector in the near future.

Changing Fertilizer Policies

The Government had introduced the Retention Price Scheme (RPS) in the year 1977 with the goals of providing fertilizers to farmers at reasonable rates without affecting the profitability of the manufacturers. The government under this policy would pay the manufacturers, the difference between the administered price (sale price) and the retention price (cost of production). Over and above the retention price subsidy, the equated freight subsidy was introduced to enable the manufacturers to cover the cost of transportation. Subsequently, in the 1990s, Economic liberalization Policy had its effect on the fertilizer industry, where the government aiming at reducing subsidy, decontrolled all the phosphatic and potassic fertilizers in

1992. More than sudden three fold increase in prices has led to imbalanced fertilizer use with the farmers opting for the lesser priced fertilizers in the market. The government also strategized in the period 2000-2007, for long term policies which focusses on promoting joint ventures, finalize policy on fertilizer pricing and capacity enhancement after evaluating existing capacity. Elimination of distribution controls on urea and gradual increase in urea prices however could not be implemented.



FACT Ammonia plant, Udyog mandal

The Nutrient Based Subsidy that came into effect in 2010 addressed reduction in subsidies through mopping up amounts under inefficient productions and feedstock. However this has impacted Phosphatic and Potassic sectors alone, while Urea policies remained untouched. Since the adoption of NBS, the retail prices of P&K fertilizers have risen while the price of urea (N) has remained fixed. The gap between the prices of urea and P&K fertilizers has widened leading to excess use of N at the expense of P&K fertilizers. The present fertilizer use ratio is highly skewed at 8:2:1 as compared to the required standard ratio of 4:2:1. This has lasting deleterious effects on economic and sustainable farming and Soil Health Management.

The current subsidy outlay of Rs 72,969 crores in the 2015-16 budget is a whopping 30 percent of the total subsidy outlay in Union Budget, however what is to be noted is that out of this, the Urea segment consumes the most - 69 percent. Thus Fertilizer subsidy, which has increased by more than five times during the last ten years, must be restructured and rationalized. The Government's

attempts at reductions in subsidies without impacting agricultural production can construe only if the price of urea is increased by at least 15-20 percent and the per tonne nutrient subsidy enhanced on P&K fertilizers to reduce their effective MRPs keeping the total fertilizer subsidy outlay constant. The present policy also need to address the issue of priority for suitable domestic gas allocations for Phosphatic sector, and consider feedstock subsidy for gas based "P" plants with poor pipeline connectivity, who are drawing expensive imported RLNG.

In the import scenario, domestic manufacturers of the decontrolled fertilizers face competition from importers due to the policy of fixation of import duties for finished products at par with the raw materials, which is not exactly conducive for sustained economic indigenous productions. Besides policies on lower priority in allocations of domestic gas for the phosphatic plants, non-availability of domestic gas due to lack of pipeline connectivity, high price of imported RLNG, all

point to poor economics for units which hitherto had been healthy.

India's annual demand for Urea is estimated at 30 lakh mts. of which, the present indigenous installed production capacity from the 30 manufacturing units is only 22 lakh mts and to maintain food security, the gap in demand has to be met through yearly imports of around 8 lakh mts. The New Urea Policy 2015, is aimed at maximizing indigenous urea production and promoting energy efficiency in urea units to reduce the subsidy burden on the Government.

The New Investment Policy (NIP-2012) of the GOI facilitates investments in Urea sector, in three categories of Revamp, expansion, revival in Brownfield and Greenfield projects. The NIP, entails subsidy payments on import parity price, based on a structure of floor price and ceiling price on fixed delivered gas price. As per the New Urea Policy 2015, the dispensation will be only for a period of 8 years from start of production, and the production is to commence within five years. Fertilizer plants consume 42.25



Maintaining the Rural Connect : Factamfos

MSCMPD for Urea manufacturing, of which, 26.5 MSCMPD is from domestic sources and 15.75 is imported LNG. The Policy's basic premise is on maintaining a Uniform gas price of around USD 10 per MMBTU, with pooled domestic gas price pegged at USD 5.18 per MMBTU.

The Urea Policy also entails mandatory neem coating for entire indigenous productions which augers well for the environment as well as reduce subsidies indirectly on extraneous nutrient losses. The Cost of neem coating is recovered by manufacturers through increase in MRP by 5 percent. The policy also provides to cause reduction in the carbon-footprint due to more efficient and environment friendly plants. Siphoning of Urea for industrial purpose is prevented and hence subsidy savings for such quantity enabled. Importantly, it promotes balanced fertilizer use and healthy soil management, which is facilitated through lesser dependency on Urea.

The Single Super Phosphate Industry consists of around 99 SSP units producing

approximately 10.25 million mts, contributing to nearly 16 percent of the total P_2O_5 production in the country. The subsidy policy includes SSP under the mandate of NBS subject to meeting industry specifications such as Subsidy being payable from either 50 percent of capacity utilization or a minimum production of 40000 mts of SSP per year per unit. Provisions for separate freight subsidy for SSP as well as for inward freight for raw materials required, and subsidy payable on minimum capacity production of 25000 mts are to be considered. The viability of this industry is dependent on the extents of subsidy provided since it is functioning and competing in a market environment wherein phosphatic fertilizers are duly subsidized.

The government's "Make in India" policy aims at attainment of self sufficiency, besides creation of jobs opportunities, and in the context of volatile global prices, a reasonable level of self sufficiency is necessary. However, the economics in the import gas based pricing for the increasing new investments in Indian Urea

sector needs to be studied vis-à-vis the receding global Urea prices and the international manufacturing capacities, and as required, a focus also is needed to explore the possibilities in participating in Joint Ventures abroad where gas availabilities are at more economical rates. With an operating buy-back arrangement for catering to India's consumption requirements, the strategy of "Make for India" also may be imbibed. There is a felt need to encourage Central Public sector Enterprises for JVs, through policy initiatives, with financial support where required. For financial support, a dedicated Sovereign Fund serving as corpus for financing the acquisitions abroad has to be set up. The need of the hour then is to put in appropriate policies to create a conducive operating environment. More relevant is the decontrol of the Urea sector.

Regarding the Potash industry in India, which is entirely dependent on imports, the present investments of Indian firms in the potash assets abroad is scant, hence the best solutions for improved economics would be to form consortiums of the Indian fertilizer firms to leverage their combined purchasing power to obtain best commercial terms under long term supply contracts or enter into JVs.

The Government is also considering, appropriate direct transfer of fertilizer subsidy/cash transfer to farmers on a per hectare basis as per scientific practices, with an expected mopping up of around Rs 12,000 crores of subsidy. The modalities of the same is yet to be finalized, considering the anomalies involved in determining who the "farmer" is, the

varying land holding patterns-of the tiller and/or owner, lack of any proper land records and absolute dearth of farmer database. The access to suitable and sizable agricultural credit by the farmers for paying fertilizer costs upfront also needs to be improved. The Banking infrastructure for the same and development of a viable and consistent system for capturing the voluminous sales transactions for enabling individual subsidy payments need to be in place. While on subsidies, it is also worth remarking, that renowned agricultural scientist Dr M.S. Swaminathan has opined that the term “subsidies” may be renamed as Support for sustainable farming so that subsidies per se need not be perceived as a pernicious ill.

Challenges in Fertilizer Marketing

The major challenge is: Logistics. Timely and sufficient supply has always been a source of concern in the industry. The Indian fertilizer industry has always been heavily dependent on the Indian Railways for distribution of fertilizers. On analysis, it is seen that 75 percent of the total fertilizer despatches and movement is through rail. Timely and sufficient supply has always been a source of concern in the industry. While the Indian railways boasts of a very extensive rail network, the infrastructure at various railheads for speedy clearances to enable timely reach at farmgate, is far from the desired. Railway policies on clearance time, lesser priority in wagon allocations at production units, and ports, non availability of wagons to desired locations also impede healthy distributions. Mechanized terminals will



The major challenge is: Logistics. Timely and sufficient supply has always been a source of concern in the industry. The Indian fertilizer industry has always been heavily dependent on the Indian Railways for distribution of Fertilizers. On analysis, it is seen that 75 percent of the total fertilizer despatches and movement is through rail.

reduce the high manual labour intervention and offer speedier clearances with lesser incidence of hook holes on bags leading to availability of better quality products with no seepage losses, to the consumers. Rail freight is presently reimbursed by the Government. However secondary freight is not considered for subsidy, and fertilizer firms lose on its operational margins since invariably rakes clearances a subsequent transportation to the rural destinations costs heavily. The current thinking on providing a single average freight to the firms also requires deep study on how it impacts the industry's economics.

The road freight industry also has its limitations. It is a matter of concern that 40 percent of the freight is carried through the national highways, constituting only 2 percent of the road network in India. The road quality is poor, and heavily congested,

with inordinate delays at multiple check points. Big volumes movement at a time is difficult in view of the limited availability of truck transporters and trucks in this segment. Over dependency on truck unions for availability, monopoly of the unions in fixation of rates, lower turnaround times for the trucks getting unloaded in the rural pockets, all pave way for delayed supplies. Nevertheless, this segment enjoys a preference in view of the lesser incidence of hook holes and the farmers ultimately get required per bag quantity of the fertilizer, in consonance with the money paid by them. It is felt that the industry needs to be more technologically advanced and adopt GPS and other truck monitoring systems to enable timely deliveries.

The industry is dependent on imports of raw materials as well as finished goods. Hence sufficient numbers of developed ports with the required infrastructure for speedy and efficient bagging and clearances operations, is a must. There are very few such globally competent ports in India, and it is hoped that focus in investments on port development will result in capacity enhancements. Coastal movement also has been gaining interest in view of the fact that it is far more fuel efficient and the fuel consumption for every tone-kilometre of freight carried is hardly 15 percent of that incurred through road transport.

Appropriate warehousing is another constraint in the industry. Godowns complying with statutory requirements for storage of fertilizers are not available at rake points or major rural consuming points. Fertilizer being a seasonal product with heavy

demand at specified times, it is essential that they are suitably placed in sufficient quantities prior to commencement of the season. Most of the godowns lack proper parking space, with limited land for expansion. They are further poorly maintained, not leak proof or with sufficient security systems, and not high enough to facilitate proper high stackings. Warehousing costs attribute around 25 percent of the total logistics costs.

The one mode of transport that requires focus is through containers. Since more quantities can be transported in comparison to road transport, this sector will help in timely supplies. However containers need to be designed in such a manner that facilitates side loading and unloading. Containers augment faster rake operations, as well as benefitting consumers with unaffected fertilizer bags.

New Outlook for Fertilizer Industry

The way ahead for sustenance of economic farming is through adoption of measures to increase agricultural productivity. It is a time tested fact that Integrated Nutrient Management comprising the use of Chemical and Organic fertilizers paves way for enhanced productivity. Regarding chemical fertilizers, hitherto the focus was on supplementing the primary nutrients, N, P and K, for crop growth. Presently the crucial role of secondary nutrients also in harnessing increase in quantity and quality of crop produce is emphasized. Fertilizer firms need to align their vision and mission with the same and widen their product portfolio, to cater to a larger segment like fortifying the

fertilizer products with elements like Boron, Zinc etc.

Large scale cooperative and corporate farming are in place, which open the door for the use of new more efficient products. Developing the markets for the same, like use of Water Soluble Fertilizers is the order of the day. New age fertilizing facilitating products based on nano technology, also are being introduced; the firms need to open up to such horizons too, as done in other countries.

The maintenance of soil fertility and health is given its due importance in integrated nutrient management practices. The industry has entered into the organic segment to supplement the fertilizing needs, by promoting and marketing city compost and animal based organic manures. This has enabled bringing in the organic sector in an organized umbrella with due importance laid out for meeting quality parameters.

Deeply entrenched in the rural sector, the fertilizer industry has direct access to the rural population. Hence the industry can safely think of widening the basket by entering the segment of other agricultural inputs such as drip-fertigation equipments, quality seeds, crop insurance, providing e-portals for informations, soil testings, as found economically viable.

Effective Ongoing Communications with the Rural masses

The agricultural scenario in the world is changing. Indian Fertilizer industry too needs to keep upgraded on the technical know-how and accomplish

again the role of change agents in Indian agriculture, as done in the green revolution days.

The industry has been highly effective in popularising the concepts of Sulphur fertilization. The saga continues with the concepts of balance Fertilizer use based on soil tests, Integrated nutrient management, Soil Health management through use of organic fertilizers, and presently with the introduction of water soluble fertilizers. Now the time is ripe for focusing on augmenting media and information technology. Extension services and modes of communications are still on traditional lines which need to be transformed. The use of mobile applications, for dissemination of knowledge, and informations on agri related matters such as crop produce rates, markets availability, weather informations, etc can be widely popularized. The infrastructure for the same is yet to meet desired levels, hence fertilizer industry's attempts into providing such extension services through IT enabled services, for the benefit of the farming community are often thwarted.

The industry has the potential to be the hub or nodal point for coordinating the various sectors like banking, insurance, even semi governmental developmental agencies, which would help to boost up the financial health of the farmer. The industry's extensive dealer network could be tapped for the same. This would also enable Companies to identify and focus on new business opportunities, developing new products that will bring in returns to the company coffers, while contributing to social development. ■■■

FAGMIL Plays Pivotal Role in Reclaiming Sodic Soil, Increasing Yield



S. K. Das
CMD, FAGMIL

FCI Aravali Gypsum and Minerals India Limited is a fully owned PSU under the administrative control of the Department of Fertilizer. It is engaged in mining of mineral Gypsum and serving the agriculture sector by supplying agriculture grade gypsum to the States like UP, Haryana and Rajasthan. It is the cheapest source of sulphur and calcium for the plant nutrition.

Gypsum as a good source of Sulphur and Calcium

Government of India, Department of Agriculture has recognised the Gypsum as a micro nutrient and is encouraging the use of Gypsum for the better production of the crops. Gypsum is chemically known as $\text{CaSO}_4 \cdot 2\text{H}_2\text{O}$ which contains 23.5 percent calcium and 18.5 percent sulphur. Plant are becoming more deficient for sulphur and soil is not supplying enough sulphur. Gypsum is an excellent source of sulphur for plant nutrition and improving crop yield. Meanwhile, Calcium is essential for most nutrients to be absorbed by plant roots. Without adequate calcium, uptake mechanism

would fail. Calcium helps stimulate root growth. Hence, Gypsum is a very good fertilizer for the crops like potato, wheat, rice, oil seeds, onion and garlic. Soluble calcium enhances soil aggregation and porosity to improve water infiltration. It's important to manage the calcium status of the soil. In soils having unfavourable calcium-magnesium ratios, Gypsum can create more favourable ratio.

Gypsum also improves the availability of soil to drain and not become waterlogged due to a high combination of high sodium, swelling clay and excess water. When we apply gypsum to soil it allows water to move into the soil and allow the crop to grow well. Gypsum should be considered as a Best Management Practice for reducing soluble P losses.

Gypsum as a good source on the reclamation of the soil

Increasing soil salinity and sodicity are serious worldwide land degradation issues. The problem of soil effected soils is pronounced in the many indogangetic plains, arid and semiarid

region is threatening agricultural expansion and productivity. It is one of the major obstacle to sustainable agriculture production. In India, about 6.9 Million Ha of sodic soils are found of which 1.63 Million of Sodic Soils are in Uttar Pradesh only. The excessive salt accumulation adversely effects soil physical and chemical properties, as well as micro biological process. Soil having more than 8.5 pH is indicating of soil sodicity. After using Gypsum and organic amendments the pH decrease in Gypsum treated soils may be due to replacement of exchangeable Na^+ during $\text{Na}^+ \text{Ca}^{2+}$ exchange and subsequent leaching. Reduction in sodic soil electrical conductivity (EC) due to Gypsum amendment has also been reported.

UP has an ambitious project under World Bank Aided Projects and successfully reclaimed about 4 lakh Ha land by using natural Gypsum. It has undertaken land reclamation project Phase I, II and III. Under this scheme the land has been reclaimed in 10 districts in first project 18 districts in second project and 18 district in the third project.



As per the report of the UP Bhumi Sudhar Nigam, the increased crop yield in the paddy was to the tune of 3.5 tones per Ha, wheat 2.7 tones (Ha) and the crop intensity in the reclaimed area is from 30 percent to 270 percent. Similarly, the increase of house hold income up to Rs. 12,000/- of small and marginal farmer.

There is a report which says from the mouth of the farmer from Utter Pradesh, 'nothing used to grow on this soil but now I harvest 40 quintal per Ha after the reclamation of the sodic soil. Not only is the soil improve but my life is better.'

The process of Land Reclamation

• **Soil Sampling and analysis:** First of all soil samples should be collected by farmers themselves after a brief training and analysed in soil laboratories. The theoretical gypsum requirement is calculated for a layer of 15 cm of soil that depends upon the total quantity of Na⁺ to be replaced on the clay complex. This also depends on the cation exchange capacity (CEC) of the soil and initial ESP.

• **Gypsum Application:** Generally 5-12 Mt Gypsum is required for one hectare. However the



The research project of the different crops was conducted in Utrakhhand and it was found that all the crops i.e. Onion, Potato, Garlic, Mustard, Spinach, Rice, Gram, Sunflower, Sugarcane, Wheat, Pea, Lentil, Maze, Berseem and Carrot were benefited with the application of Gypsum. Gypsum can do miracle to the sodic soil by improving the soil condition and increasing the yield and cropping intensity.

quantity of Gypsum to be required depends upon the nature of the soil like whether soil is of Class B Sodic Land [Growing One Crop per year] or class C sodic Land [Uncultivated through the year]

• **Period:** This is a 3 years Project but the whole Gypsum are mixed with the soil during 1 Year. The quantity of Gypsum recommended, depends on the nature of the soil. It is better to use the gypsum in Khariff season rather than Rabi season. From 2nd year and onward the proper agronomical practices should be followed to reclaim the soil.

• **Gypsum mixing and leaching:** Gypsum is mixed thoroughly in the soil spreading over the field. Gypsum is applied after initial flushing of salts with irrigation. Gypsum mixing is followed by impounding of water for 12 to 15 days thereafter once soluble sodium is flushed out through field drain/link drain.

Research project of response of Gypsum on sodic soil in Bihar

FAGMIL conducted the research study on "Response of FCI Aravali Gypsum in reclamation of calcareous sodic soil in Muzaffarpur District of Bihar" through Rajendra Agriculture University, Pusa, Bihar which reported wonderful and unbelievable yield increase on the wheat and rice crop of Bihar.

The grain yield of rice-2010 increase from 19.8-36.3 q/ha under control and treatments receiving 50 percent of Gypsum Requirement + Press mud @ 10 t/ha + Dhaincha + Recommended dose of Fertilizer, respectively.

Group	Crops	Yield (q ha ⁻¹)		% Yield Increase
		Treated	Control	
Cereals	Wheat	44.9	42.8	4.91
	Rice	44.1	40.8	8.00
	Maize	36.0	35.0	2.86
Oil Seeds	Mustard	12.7	11.0	15.32
	Soyabean	24.0	20.7	15.9
	Sunflower	25.0	23.6	5.93
Pluses	Lentil	83.1	80.1	3.75
	Pea	81.0	77.7	4.31
	Gram	38.2	36.0	6.11
Vegetables	Garlic	85.8	71.0	20.88
	Onion	210	170	23.53
	Carrot	179.3	175.9	1.93
	Spinach	8.4	7.5	12.00
Cash crops	Potato	230	190	21.05
	Sugarcane	850.0	809.4	5.02
Forage	Berseem	599.6	583.0	2.85

The Percent increase in grain yield was maximum (83 percent) in the treatment over control.

The grain yield of wheat (2010-2011), varied from 19.5 to 45.4 q/ha, and the straw yield from 32.2 to 67.0 q/ha. The maximum grain yield was recorded in treatment (45.4 q/ha) control (19.5 q/ha). The same increasing trend of rice grain yield was also recorded. The maximum grain and straw

yield was found to increase by 132 and 108 percent, respectively, over control. The increase in grain yield was significant under all treatments over control.

The research project of the different crops was conducted in Uttrakhand and it was found that all the crops i.e. Onion, Potato, Garlic, Mustard, Spinach, Rice, Gram, Sunflower, Sugarcane, Wheat, Pea, Lentil, Maze, Berseem

and Carrot were benefited with the application of Gypsum.

Gypsum can do miracle to the sodic soil by improving the soil condition and increasing the yield and cropping intensity. Thus, improving the living condition of the sodic soil effected area. The Government of UP should extend the reclamation project as till the date only one-fourth of sodic land has been reclaimed where the farmers have appreciated the efforts of the Government and enjoying better life by higher yield and forming self-help group in those areas.

Bihar has yet to take up the project which will make the life of salt affected area happier by improved yield and increased income.

Government of Haryana has also taken initiative to procure Gypsum and distribute the same to the farmers at a very subsidized rate. ■■■



Energy Efficient Revamp Measures in Ammonia Plants



K. Karkun
Sr. Advisor, PDIL



P. Chakraborty
GM (Process), PDIL

Abstract

Spiraling energy and high capital costs for installing grass-root medium and large capacity Ammonia plants coupled with acute shortage in gas supply, have forced planners to set reduced energy consumption targets for existing Indian ammonia plants. To meet the above, it is necessary to carry out revamping of the existing plants for improving energy efficiency, after carefully carrying out cost benefit analysis. Present paper briefly describes the various revamp options available for improvement of energy efficiency, to counter to some extent, the problems faced in the wake of shortage in gas supply.

Introduction

Lower prices of Ammonia in the world market, alongwith, increasing installation cost of grass-root plants, diverted attention more realistically, towards revamping of existing ammonia plants. Earlier, the importance of low energy consumption in large and medium capacity ammonia plants, operating for the last 25 – 30 years, was relegated to the background, against the factors like on-stream efficiency,

capacity utilization factor, which were then regarded as yardstick for measurement of better performance. However, as India gradually got engulfed in the energy crisis prevailing worldwide, economics of ammonia production changed radically, and, became more and more dependent on energy cost. Currently, Indian fertilizer industry is left with two plausible options, for its survival, namely,

- Improving energy efficiency of the existing older generation plants, thereby enhancing gas through put potential, and,
- Subsequently diverting quantum of gas equivalent to energy saved thereby, to new low-energy large-capacity grass-root plants.

Prevailing market scenario, also determines the economics of Ammonia production through revamp. While nitrogenous fertilizer production has not been a profitable business in the Western World during the last decade or so, in U.S.A the situation is otherwise, because of the discovery of huge quantity of shale gas. In India however, the picture is somewhat different because, through administered

Pricing System, Government has been paying subsidy for decades, which encouraged Ammonia manufacturers to produce more, complying with specified efficiency norms. Against the above back-drop, energy saving revamp projects have become all the more attractive, today.

Action Plan for Energy Saving Revamp Projects

Revamp projects are executed with following objectives over a pre-determined time frame:

- Reduction in specific energy consumption, to the extent techno economically feasible.
- Reduction in recurring maintenance cost.
- Energy saving revamp measures to be based on proven technology.
- Minimum replacement of existing equipment.

Various Revamp Options Available

Energy saving measures discussed in this paper is generic in nature. During actual implementation, revamp measures need to be tailor-made to suit specific requirements. Energy saving

options in the Front-End and Back-End sections of ammonia plant, are discussed briefly.

Revamp Measures in Front-End

Following energy saving measures are in practice in the Indian fertilizer plants:-

- Reformer re-tubing.
- Lower steam / carbon ratio.
- Saturator for feed gas saturation .
- Installing Adiabatic Pre- Reformer.
- Transferring load to Secondary Reformer.
- Gas Heated Reformers.
- Improved H.T. Shift Catalyst.
- Energy Saving through Low Temperature Shift Converter.
- Heat recovery from Stripped Process Condensate.
- Energy Efficient Decarbonation Process.
- M.P. Process Condensate Stripping.

Reformer Re-Tubing

Most reformers in Indian Ammonia plants have been re-tubed using higher diameter (inner) tubes made of micro-alloy material. Few old reformers are fit for re-tubing with higher diameter micro-alloy tubes, thereby giving significant leverage towards energy saving, by operating with lower pressure drop and lower maximum tube wall temperature.

Lower Steam – Carbon Ratio

Primary reformer furnace is a major heat sink in Ammonia plant. Reduction in steam-carbon ratio has concomitant advantages, in (i) reduced fuel consumption, (ii) lower pressure drop in reformer,

and (iii) higher recovery efficiency in Waste Heat Recovery section, thereby resulting in lower specific energy consumption. However operating reformer with minimum steam / carbon ratio is determined by the activity of H.T. Shift Conversion catalyst. Though recognized safe limit for copper-promoted H.T. Shift catalyst is 2.8, un-confirmed reports of operation with 2.74 steam-carbon ratio, indicates higher energy saving.

Saturator for Feed Gas Saturation

Feed gas, prior to its entry to reformer, picks up steam from circulating hot water in Saturator. Probable heat supply sources to circulating water are, (i) process gas entering MDEA reboiler and, (ii) in-efficient waste heat recovery section of primary reformer, operating with high flue gas stack temperature.

Energy saving through Feed Gas Saturation is reflected in (a) reduction in steam supply to ammonia plant, or, (b) increase in steam export to downstream plants.

Installing Adiabatic Pre-Reformer

Highly active nickel catalysts in adiabatic pre-reformer, operating with low steam-carbon ratio, enables total conversion of all higher hydrocarbons in feed gas to CH₄ and carbon oxides. Higher-hydrocarbon free outlet gas from pre-reformer, permits higher reformer inlet temperature of 625^o – 650^oC, compared to 515^o-525^oC in conventional reformer. The benefits derived in terms of energy-saving, can be summed up as mentioned below:-

- Reduction in Reformer firing duty (approx. 12 percent - 15 percent reduction in fuel)
- Reduction in flue gas flow, with reduction in ID Fan and FD Fan power.
- Transferring part of radiant section duty to Convection section, resulting in higher energy recovery efficiency.

Transferring Load to Secondary Reformer

Additional energy saving in a reforming system can be achieved with the transfer of 'reforming' load from 'heat-absorbing' primary reformer to adiabatic secondary reformer. The above is possible with,

- Modification or, replacement of existing AIR-GUN assembly with new energy-efficient design.
- Replacement of catalyst with multi-hole / multi-rib ring type catalyst. Better AIR-GUN assembly design ensures perfect mixing of process air and process gas within combustion zone, while better catalyst shall guarantee lower methane leakage.

Gas Heated Reformers

Gas heated tubular reformers like KBR – KRES reformer or, HTAS – HTER reformer, function best when operated in parallel with the externally fired reformers. Hot gas from secondary reformer supplies heat of reformation in KRES / HTER reformers, and help in reducing fuel requirement and achieving lower levels of NO_x and CO₂ emission.

Improved HT Shift Catalyst

New variety of copper promoted HT shift catalyst, which can operate at low steam-carbon ratio, offers following energy saving

opportunities:-

- Reduction in fuel requirement in primary reformer commensurating with low steam – carbon ratio.
- Operating with lower temperature at HT Shift reactor inlet, gives opportunity for recovery of higher quantum of high level waste heat.

Energy Saving through LT Shift Converter

LT Shift Conversion is the last equilibrium controlled reaction stage for determining the inert content in make-up synthesis gas. With the availability of better catalyst variety (high copper type), additional catalyst volume can be installed in parallel reactors for achieving energy saving to the tune of 0.04 to 0.05 Gcals / Te ammonia.

Heat Recovery from Stripped Process Condensate

Process for recovery of heat from stripped process condensate has been patented by PDIL and the same is operating in KSFL Shahjahanpur Ammonia plant for last 2 decades. Heat from process condensate is recovered through preheating of Feed NG. Energy saving of around 0.06 Gcals / Te ammonia, has been achieved.

Energy Efficient Decarbonation Process

Some of older generation plants are continuing with single-stage, energy consuming decarbonation process. Latest physical absorption and hybrid (physico – chemical absorption) processes with 2-stage regeneration, operate with reduced energy consumption. Physico-chemical absorption process of BASF, using MDEA

(Methyl Diethanol Amine) solvent with 2 stage regeneration in LP & HP flash columns alongwith stripping in LP stripper consumes very low energy. Energy saving of around 0.15 to 0.25 Gcals / Te ammonia, has been achieved by changing over to MDEA process.

M.P Process Condensate Stripping

Process condensate containing dissolved CO₂, NH₃, methanol, aldehydes etc., formed in Front End section of Ammonia plant, is steam-stripped at medium pressure for generating DM water, for re-use in plant. Vapour leaving stripper from top is fed to Primary Reformer, thereby supplementing steam requirement in primary reformer by 20 – 22 percent. Multiple advantages, like, (i) Elimination of “Carbon-Loss”, (ii) Obtaining better quality of reusable treated condensate, and, (iii) Saving of energy to the tune of 0.08 to 0.10 Gcals / Te ammonia, can be achievable in Indian ammonia plants.

Revamp Measures in Back-End

Out of the energy saving measures being practiced, following three are highlighted:-

- Modification In Synthesis Converter.
- Purification by Liquid Ammonia Wash.
- Use of Molecular Sieve Drier.

Modifications in Synthesis Converter

Following options are available for revamping of existing converters:-

- Replacement of axial-flow type by radial or axial-radial type alongwith interbed heat

exchanger. This can be accomplished by pressure shell replacement and / or by replacement of basket only.

- Modification of Quench converter basket to radial-flow type.
- Installing single-bed radial flow converter, at the downstream of existing converter.

Above modifications, render benefits in terms of aa) maximum conversion, bb) Significant energy saving.

Purification by Liquid Ammonia Wash

Scrubbing make-up synthesis gas counter-currently with liquid ammonia at around 70 ata, produces gas free from CO, CO₂ & H₂O, thereby permitting the gas to enter converter directly. As a result, pressure drop in synthesis loop is reduced, with concomitant energy saving, to the tune of 0.1 Gcals / Te ammonia.

Use of Molecular Sieve Driers

Molecular sieve driers are capable of removing H₂O, CO₂ and NH₃ impurities from make-up synthesis gas. Approximate energy savings of around 0.05 – 0.06 Gcals / Te ammonia, can be easily achieved.

Conclusion

In the current Indian scenario of non-availability of gas, latest & proven energy saving options need to be implemented for revamping of existing plants. Most of the Ammonia / Urea units in India had gone through one phase of revamping measures in their plants. Recent policy announcement of Government necessitates further revamping measures in order to achieve stipulated energy efficiency norms. ■■■

Designing of energy efficient fertilizer plants



Anjali Bhatia

Freelance Journalist

When the fertilizer industry began developing worldwide, the role of designing energy efficient plants was hardly taken into consideration because the primary aim of the builders of the plant was to get down to the task of making fertilizers with an intention of not making too much profits. But things changed after the oil crises of the 1970s when, process designers started to pay more attention to energy efficiency as well as reliability and the capital cost of the plant.

When the need to save energy began gaining in priority, in the mid 80s, a few highly energy efficient ammonia plants were commissioned around the world, with specific energy consumption values close to 29 GJ/t ammonia. The first large scale ammonia plant (1350 tpd) that used gas as feedstock were also built in India around the same time. However, the energy consumption of the Indian plants was higher than the high-efficiency plants elsewhere, because the owners of the projects that were being set up preferred plants with trusted technology and equipment. The reason was because of their experience with low performance

standards of some plants that were commissioned in the 1970s, which had tried various kinds of technologies for reasons best known to them.

With the emphasis on productivity and saving on cost of energy, Indian ammonia plants started to introduce a number of new measures which would improve the working of the plants and also incur less financial burdens than that were being forced on them more out of choice and less out of chance. And to tackle the energy problem during the 80s, an attachment called the Purge Gas Recovery (PGR) unit for recovery of hydrogen from purge gas, was introduced. All the PGR units were based on cryogenic separation of hydrogen, which was recycled back into the synthesis loop. Some of the later generation plants installed hydrogen recovery units using the membrane process. Till then, the purge gas was burnt as fuel in the reformer. This measure alone reduced specific energy consumption by 0.63-1.05 GJ per tonne of ammonia.

The second most significant development was the increased availability of reformed tubes that had better metallurgy than

the HK-40, or equivalent, which was used in most reformers. This allowed larger inner space for the packing of catalysts and, hence, higher throughput. It not only increased the reformer capacity but also helped to improve energy efficiency of operations. This new practice continued even into the 1990s in various plants. Other measures included the use of solvent promoters in CO₂ removal sections, and better heat recovery in the convection zones of reformer furnaces.

During the 1990s, in the reformer sections, there was renewed emphasis on the recovery of additional waste heat from the off-gases of reformer furnaces. In the relatively new plants, the temperature of off-gases was brought down to as low as 150-160°C from more than 200°C. Along with other heat integration steps in the ammonia plant, these steps reduced energy consumption by 0.1-0.2 Gcal (0.42-0.84 GJ) per tonne of ammonia. Around the same time, CO₂ removal systems were improved; new measures included using better solvents, better packing in absorption and desorption towers for higher mass transfer efficiency, and a change over from

LP condensate stripper to MP condensate stripper. In one of the plants, energy consumption was reduced from 0.15 GJ/Mol CO₂ to 0.105 GJ/Mol CO₂ with a change of solvent from amine to Methyl Di-ethanol Amine (MDEA).

Other efforts included changing the internals of synthesis converters in old plants from axial flow to radial-axial or radial flow, which allowed the use of more active catalyst of finer particle size without increasing the pressure drop through the reactor. This in turn resulted in an increase in conversion per pass and thus reduced the energy consumption of recycling synthesis gas. This measure alone saved 0.84-1.05 GJ per tonne of ammonia.

Almost all old ammonia plants changed from analog to digital instrumentation with screen based controls. The installation of distributed control systems (DCS) and programmable logic controllers (PLC) became the norm in the 1990s. Most of these plants that were commissioned in the 1980s and designed for 33.05-34.73 GJ per tonne were able to reduce their energy consumption down to 32.22-32.64 GJ per tonne of ammonia with the use of such systems.

Large ammonia capacity of about 5 million tonnes was added in India in the 1990s through nine new plants. Each of these plants had a capacity of about 0.5 million tonnes of ammonia per year. A number of these plants included new features, such as a gas turbine (GT) drive for process air compressors with heat recovery from the exhaust gas of a turbine.

During the second half of the 1990s, a number of plants undertook projects to stop bottlenecks

in their operations, and energy saving measures were implemented simultaneously. These measures included:

- The installation of combustion air pre-heaters in reformer stacks to bring down the exhaust temperature to as low as 120°C whenever the sulfur content of natural gas allowed
- The introduction of low temperature shift (LTS) guards with additional heat recovery to pre-heat boiler feed water, which helped to reduce CO slip from 0.20 to 0.10 mole percent at the exit of the LTS converter, resulting in energy saving of 0.84 GJ/t NH₃ in some plants
- Changing from single to two stage regeneration in CO₂ removal sections, which allowed better heat integration
- Changing single stage flash vessel systems in the regenerator section to multistage flash vessels with ejectors
- Using a mechanical steam compressor
- Installing a hydraulic turbine to recover energy from high pressure process fluids.

There have also been some process modifications in the synthesis loop. The installation of an S-50 converter with a medium pressure waste heat boiler is reported to have saved 0.29 GJ/t of energy. Using an additional converter increased conversion from 14 to 19 per cent, or even higher, resulting in savings in recycled energy. Similarly, one of the units installed an S-300 converter with an energy saving potential of 1.46 GJ per tonne of ammonia.

Using liquid ammonia to wash synthesis gases has helped remove CO₂ and moisture

impurities. Discharge from synthesis gas compressors was originally going to the first stage ammonia separator via chillers and then to the converter. After additional purification, it now goes directly to the converter and thus saves energy in the chillers. In some other plants, energy consumption was further reduced by chilling the makeup synthesis gas and air at suction end of process air compressor with the use of absorption refrigeration using low-grade waste heat from the plant.

Numerous other small measures have been implemented by ammonia plants in India. For example, feed gas saturation with process condensate has helped to conserve energy. Most plants use a DCS and take full advantage of automation. A number of units have installed advanced process control (APC). While energy savings are small in the range of 0.13-0.21 GJ per tonne of ammonia, the operation of the plant becomes very smooth with the control of most operating parameters within a narrow range. Using variable frequency drives for fans and pumps have also become common. A number of plants have changed steam turbine drives to motor drives for higher efficiency.

As a result of these energy conservation efforts and the addition of capacity through more efficient plants, the weighted average energy consumption of ammonia plants in the country was reduced from 52.17 GJ/t NH₃ in 1987-88 to 36.9 GJ/t NH₃ in 2011-12, showing an almost 30 percent improvement in the energy efficiency of ammonia production.

It is significant to note that the

Fertilizer Association of India makes projections for the requirement of ammonia in agricultural use. It is assumed that, with the exception of a few, most of the existing plants will continue to operate in 2030. Beyond that, some of the older plants will close. An IEA (1) working paper has projected ammonia production of 19, 26 and 33 Mt by 2015, 2030 and 2050, respectively. The present capacity based on liquid hydrocarbons will be changed to gas by 2015-16. It is envisaged that average energy consumption of the existing plants will be 34.61 GJ per tonne of ammonia by 2015-16 and will decrease to 33.69 GJ per tonne of ammonia by 2030. Efficiency improvements will come as a result of further modernization of gas-based plants and a change of feedstock from fuel oil and naphtha to natural gas. These plants will retain use of coal for the generation of steam and power. Naphtha-based plants will also change to gas. Further, it is assumed that additional production will come from new plants with an average energy consumption of 29.26 GJ per tonne of ammonia by 2030.

Projections for 2050 are highly uncertain. According to FAI estimates, there will be demand of about 28 million tonnes of nitrogen by 2050. However, how much of it will be based on domestic or imported ammonia remains speculative. It is expected that the production of ammonia in India will be in excess of 30 million tonnes. A significant part of present capacity may be replaced by the plants based on the best available technology with energy consumption levels in the order of 28 GJ per

tonne of ammonia beyond 2030. Given these assumptions, the of 2.23 tonne of CO₂/tonne of ammonia produced.

Projections for Energy Consumption in Indian Ammonia Plants

Year	Production (million tonnes)	Energy Intensity (GJ/t NH ₃)	Total Energy Consumption (PJ)
2009	13.25	36.76	487
2015	18.15	34.61	608
2030	26.39	33.69	837
2050	30.15	30.73	926

projections for production and energy consumption are given in the table.

Emissions of Carbon di-Oxide

Carbon dioxide (CO₂) is generated during ammonia production. It can be extracted and used for production of urea. In India, all ammonia plants (except two) have integrated urea plants. There is a direct relationship between energy consumption and carbon dioxide emissions. This results in energy saving and production of another useful raw material in the form of CO₂.

International Fertilizer Industry Association (IFA) has recently reported on the carbon dioxide emission factors for ammonia plants based on gas, naphtha and fuel oil feedstock, and the FAI has worked out the CO₂ emissions from Indian plants using these factors. The factor for Indian ammonia plants was calculated taking into account the type of energy form used and the average energy consumed for each type of energy form (natural gas, naphtha and fuel oil). Indian plants produced 13.25 million tonnes of ammonia in 2009 and they are estimated to have emitted 29.6 million tonnes of CO₂ – i.e. an average emission factor

The targeted production of ammonia is estimated to increase to 18.2 Mt of ammonia by 2015, 26.4 Mt by 2030 and 30.15 Mt by 2050. These figures take into account the expected revamping and retrofitting of existing gas-based plants, the implementation of energy conservation schemes, the conversion of non-gas-based plants to gas plants, the commissioning of new plants based on more energy efficient technologies, and the occasional closure of some old plants. It was estimated that the CO₂ emission factor per tonne of ammonia will have progressively improved to 1.92, 1.82 and 1.75 t/t by 2015.

In a two-day workshop on Improving Energy Efficiency in Fertilizer Plants in New Delhi held in August 2012, deliberated on the Perform Achieve and Trade (PAT) Scheme being implemented for energy intensive sectors including fertilizer sector. A wide variation in energy consumption across various consumers in the same sector on account of technology, feed stock, plant size and vintage etc. was referred. It was felt that while working on modalities for setting the targets, it was not found feasible to fix uniform target for all DCs. Therefore, targets have been fixed, specific to every consumer

to improve upon their own baseline specific energy consumption. It was recognized that in each sector, some plants have achieved energy efficiency of international standards. It was maintained that, the Act mandates even most efficient plant should endeavor for continual improvement. A reference was made to the incentive available under the scheme, in the form of Energy Saving Certificates (ESCert). It was said that all DCs must comply with various requirements of the Act and submit "Action plan" for achieving energy reduction targets. Stress was also laid on the need for integration of software tools and developing algorithms to improve energy efficiency on real time basis.

It was also said that India

produces about 22 million tonnes of urea per year. The energy cost accounts for 80% of the cost of production. Therefore, survival of the industry depends on improvement in energy efficiency. There was concern that no fresh investment has been made for adding new capacity during last 12 years and attributed the reason mainly to existing pricing policy and uncertainty in availability and pricing of natural gas. It was also noted that Indian plants are producing urea at a cost much lower than the price of imported urea even with higher input feedstock cost. India imports around 7 million tonnes of urea every year. By producing this additional quantity indigenously, country could have saved significant amount on subsidy.

It was appreciated that a number of efforts have been made by the industry to improve energy efficiency. A number of retrofits have been implemented, resulting in considerable improvement in performance. Now, measures for saving even very small energy are being implemented. One such measure is installation of Furnace Management System which is more efficient for monitoring of burners than conventional pyrometer system. It helps in optimizing the furnace performance and thus saving fuel. Another was wherein in an ammonia plant based on Kellogg's process, regenerative pre-heater having circumferential clearance has been replaced with SS plate type heat exchanger, reducing stack temperature considerably. ■ ■ ■



Issues & Challenges in Efficient Market Management



Dr. I. Vijayakumar, I.R.S.
CMD, MFL

Background

Since time immemorial, fertilizer industry has been in the lime light of Nation's prosperity towards achieving the food security. It is in this perspective, that Government enhances the fertilizer productivity with a vision to aim for self-sufficiency both in food grains and fertilizer production and emphasize on organic farming in order that the society stays healthier and also to export eco-friendly agriculture produce.

Consequent upon the increase in population growth, Government has envisaged the preparedness of increasing the food grains output of existing farm lands by way of latest irrigation techniques conforming to the demand of food grains needed by the citizens. Long term plans from time to time are implemented for enhancing the fertilizer industry's output in order to meet the requirements of people. In this connection, various irrigation projects through dams, canals have been dedicated in various States, taking into consideration of the economic divergence so that, all the inputs necessary for the growth of fertilizer sector is taken care of so as to reach

the farmers in affordable price and compensate them for the hard work rendered by them and also in case of catastrophic damage to protect the farmers financial burden by waiving loans and during normal time to repay the loans to the banks in easy instalments and also the livelihood of farmers is given top most priority for their prosperity and the Nation at large and still many miles to go in this sector to achieve the objective.

Since 1950, the population is increasing exponentially and now it has touched 1.25 billion in India itself out of around 7.1 billion of world population. This speaks volume about the emphasis and the need that India as second largest consumer of fertilizers after China has to put the sustained efforts in agriculture industry using the latest technological advancement, balanced fertilizer application, increasing per acre yield of food grains and to manage the integrated pest management by using eco-friendly pesticides to reduce toxin effect for healthy living of human beings, cattles and other living species and the present contribution of fertilizer industry in Gross Domestic Product (GDP)

has been around 20 percent.

Status of Indian Fertilizer Industry - Urea

Presently in India, we have 30 Urea producing units out of which, 27 units are gas based, and three units naphtha-based. Government is contemplating to convert these three units into gas so as to increase the energy efficiency and to reduce the subsidy burden. These three units await gas connectivity.

Balanced fertilizer application

The prevailing major concern is the indiscriminate use of fertilizers by farmers especially Urea, since it is the cheapest fertilizer available in the market for which the Government is paying heavy subsidy. Presently, the optimum usage of fertilizers per agriculture Department for NPK has been in the ratio of 4:2:1 but farmers are applying in the ratio of 8.2:2.7:1. The excess application of Urea is due to Government's low administered price. The balanced fertilizer application will be realised only if the Urea price is increased to the extent of full / partial de-control as is done for Phosphatic and Pottassic Fertilizers (NP/K).

Alternatively, the extent of increase in Nutrient N can be reduced in P&K, so that farmers can apply enhanced quantity of NP/K products. Further, the value added urea product, Neem coated Urea has been introduced in the market recently per Government's directive in order to curb the excess application N Nutrient, thereby Government can foresee a reduction of Urea application as well around 15 percent reduction in Urea subsidy burden for the Government. This would pave way for balanced fertilizer application and consequent enhancement in food grains productivity with a thrust given to quality as paramount importance.

Eco-friendly products

Introduction of the eco-friendly products is the need of the hour in order to maintain soil, texture and fertility for increasing crop yields towards food security. The City Compost, Neem based products, Bio-fertilizers and Organic Manure are the complimentary products for reducing chemical fertilizers. Per Basket Approach, all the fertilizer manufacturers shall have to conduct intensive promotional programs under basket approach and emphasise the need in sustained manner to farmers for the application of 4/3 bag of organic fertilizer vs. 6/7 bag of chemical fertilizers. We at MFL, has been marketing Organic Manure and Neem Pesticides since three and ten years respectively and MFL is also manufacturing and marketing Vijay Bio-fertilizer since two decades in order to enrich the soil fertility and to enhance the productivity of food grains with quality in eco-friendly manner.

Transport of fertilizers – Government guidelines

To reduce the transport freight, the Government can introduce Product Exchange concept by which enormous freight subsidy component can be saved especially for Urea. Another important component playing vital role for the replenishment of fertilizers in time is proper transport arrangements (Rail / Road) in order to get the product on time during basal / top dressing of fertilizers in peak agriculture operation period since the fertilizer off take is time / place bound as well as seasonal. Presently, for Complex and Urea, the freight per RR through Rail mode is fully reimbursed up to Railhead and from Railhead District Average Lead distance is fixed for Urea movement alone. This secondary transport charge from Railhead is to be extended for complex fertilizers also. For Road movement, the maximum distance is fixed at 500 KMs. This has to be increased to 1000 KMs because sometimes, we may not be in a position to send a single product by Rail due to Plant machineries overhauling / repairs as well due to season prevalent in the marketing territory.

The freight reimbursement through Road has to be fixed as 90% of the cost of transportation incurred by the manufacturer's rather than present system since we are appointing Road Transport contractor through tender process per Government/Vigilance guidelines taking into consideration of market freight rate.

Import of fertilizers / raw materials

At present, our Nation's consumption of Urea has been 30

million tons out of which 22 millions are indigenous and around 8 million tons of Urea are through Imports. As far DAP is concerned, out of 7.5 million tons of requirement, our indigenous has been 3.5 million tons and import is around 4.0 million tons. The complex fertilizer consumption has been 7.0 million tons and by and large, our indigenous production is self-sufficient. MOP is another major nutrient and 100% requirement of India (3.5 million tons) has been met through Imports. For producing complex fertilizers, the raw materials required are Urea, Phosphoric acid and MOP. Urea and MOP are available in the global market and India as 3rd largest importer of fertilizers in the world, is monitoring and controlling the demand and supply of the above commodities and procuring at the reasonable price, whereas the demand for phosphoric acid is more than supply requirement due to restricted availability of its raw material rock phosphate. Hence, in order to run all the complex units viable, Government shall have to implement the following considerations viz. rationalisation in port charges, priority berthing of Phosphoric acid, MOP and Urea and equal-distribution of phosphoric acid etc., customs / excise duty / VAT as detailed in the Table 1.

Import of raw materials for complex production, the port charges should be kept uniform throughout the country and rationalisation to this effect is contemplated.

Since the Port charges are also playing vital component in determining the end product cost, the port charges are to be maintained uniformly throughout the country.

Table 1: Port charges at Important Ports

S. No.	Name of the Port	Present Port charges (USD/MT)
1	Chennai	1.69
2	Cochin	0.88
3	Mumbai	1.06
4	Krishnapatnam	1.16

Government's direction on important issues

Government should give direction to the port authorities especially raw material viz. Urea, MOP, Phosphoric acid and finished fertilizers ships are to be given immediate priority berthing to avoid demurrage etc.

The Phosphoric Acid supply at global level has come down due to restricted availability of its raw material rock phosphate. In the event of reduced supply for India, GOI shall exercise its legislative / executive powers and to monitor that the acid is distributed to all PSUs so as to avoid economic concentration and to save freight subsidy as well to keep all PSUs viable and vibrant.

Customs Duty, Excise Duty, VAT etc. to be abolished so that fertilizers cost will be reduced and affordability of fertilizer purchases by farmers can be enhanced for National prosperity.

Promotional programs - Corporate Social Responsibility

Another important area that all the fertilizer manufacturers in their operating territory shall have to continuously meet the farmers and address their agriculture problems with the coordination of State Department of Agriculture. A sustained effort on promotional program viz. soil testing, demonstrations, enhancing dealer network, ensure

fertilizer availability on MRP rates to farmers, health campaign for farming community and their pet animals, eye campaign, obtain good drinking water supply through nearby natural resources, educational and cultural programs are to be performed in a structured manner under Corporate Social Responsibility to ensure and to enhance the quality of life of rural mass.



The present MFL Plants are more than two decades old and we have around 330 acres of land sufficient to erect a new green field Urea Plant. Present MFL's urea production capacity is around 5 lakh MT per annum. This can be enhanced to 8 to 10 lakhs, by which energy efficient Ammonia and Urea plants can be commissioned under green field project and to increase NPK production to 4.5 lakh MT per annum with the available two trains.

Prime Minister's Vision

To attain the dream of the Hon'ble Prime Minister's vision of "Make in India" concept a reality, for import substitution the agriculture industry can be developed in India itself and also to adhere to the United Nations Convention on reducing climate change at global level to reduce the pollution and global warming by introducing advanced technology Plants. Now at global level the carbon credit is the talking point and latest advancement in technology of Ammonia / Urea Plants are to be considered taking into consideration of global warming and to satisfy the developed / developing countries for environmentally viable projects at global level.

MFL's mission

The present MFL Plants are more than two decades old and we have around 330 acres of land sufficient to erect a new green field Urea Plant. Present MFL's urea production capacity is around 5 lakh MT per annum. This can be enhanced to 8 to 10 lakhs, by which energy efficient Ammonia and Urea plants can be commissioned under green field project and to increase NPK production to 4.5 lakh MT per annum with the available two trains.

With enhanced productivity of Urea / NPK for distributing the inputs required for farming community, to reduce subsidy burden for Government, consequent increase in food grains productivity towards food security and also keeping in view of our Indian auxiliary units' sustainability and also to inculcate the Corporate Social Responsibility for the industry to develop the society in terms of social and economic prosperity and to attain self-sufficiency of Mother India. ■■■

अब शुरू हुआ i kskd mozdka का दौर



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बीते चार दशक में देश में कृषि पैदावार बढ़ाने की धुन में किसी का ध्यान जमीन की पोषकता की तरफ नहीं गया। हरित क्रांति की शुरुआत के बाद से पूरे देश पर सिर्फ एक ही धुन सवार रही कि खाद्यान्न के मामले में देश को आत्मनिर्भर बनाना है। इस होड़ में अंधाधुंध और अनाप-शनाप तरीके से खेतों में उर्वरकों का इस्तेमाल हुआ। पैदावार बढ़ी, देश में अनाज के भंडार बने, सूखें और बाढ़ की स्थिति में खाद्यान्न की दिक्कत का दौर खत्म हुआ। लेकिन इस सबके लिए पूरे देश को एक बड़ी कीमत चुकानी पड़ी। यह कीमत थी जमीन की उर्वरता की।

पैदावार में वृद्धि के जोश में न तो किसानों का ध्यान साल में तीन तीन फसले देने वाली अपनी खेती की जमीन की तरफ गया और न ही वैज्ञानिक स्तर पर जमीन की उर्वरता को बचाए रखने या उसे संतुलित रखने के लिये सरकार की तरफ से बड़े पैमाने पर अभियान चलाये जा सके। नतीजा यह हुआ कि जमीन की उर्वरता घटती चली गई और उसके पोषक तत्वों में तेजी से कमी आती गई। उर्वरकों खासतौर पर यूरिया के उपयोग ने कृषि योग्य जमीन का पूरा पारिस्थितिक संतुलन ही बिगाड़ दिया। देश में बुआई के कुल रकबे में पैदावार का अनुपात तो बेतहाशा बढ़ता चला गया। लेकिन सस्ते यूरिया के उपयोग ने जमीन के पोषण के उपायों पर ब्रेक लगा दी।

क्या पैदावार बढ़ाने का यह तरीका गलत

था? साठ-सत्तर के दशक में जिस वक्त पैदावार बढ़ाने के लिए ये फैसले लिए गए, यदि तब के संदर्भों को ध्यान में रखकर देखा जाए तो शायद पैदावार बढ़ाने के लिए किए गए उपाय गलत नहीं थे। अलबत्ता जमीन के पोषण को उतना महत्व नहीं देना शायद कुछ हद तक गलत हो गया। उर्वरकों के बेहतर इस्तेमाल से ज्यादा संभवतः उस वक्त सस्ती खाद की उपलब्धता की आवश्यकता महत्वपूर्ण थी। इसीलिए यूरिया का इस्तेमाल अन्य पोषक खादों की तुलना में ज्यादा हुआ। नब्बे के दशक में सरकारने अन्य पोषक खादों के इस्तेमाल को बढ़ावा देने पर सरकार का ध्यान तो गया, लेकिन शायद हम उन्नत होती खेती के चरम तक नहीं पहुंचे थे, इसलिए किसान समेत किसी का ध्यान जमीन की पोषक क्षमता पर नहीं गया।

लेकिन अब जमाना बदला है। किसान अपनी जमीन को लेकर जागरूक हो रहा है। बीते एक दशक में किसान जमीन के पोषण को लेकर चिंतित हुआ है और उसकी यह चिंता उर्वरकों के इस्तेमाल के तरीकों में आए बदलाव में साफ झलक रही है। इसकी एक वजह आर्गेनिक उत्पादों की बढ़ती मांग या रासायनिक खादों खासतौर पर यूरिया के स्वास्थ्य संबंधी प्रभावों के प्रति बढ़ी जागरूकता भी है। लेकिन यह इस बदलाव का महत्वपूर्ण हिस्सा तो है, परंतु यह बदलाव की मूल वजह नहीं है। मूल वजह है किसानों में अपनी जमीन के पोषण को लेकर बढ़ती चिंता। सरकारी विभागों और खासकर फर्टिलाइजर कंपनियों ने इसके प्रति जागरूकता बढ़ाने में अहम भूमिका

अदा की है। इफको और कृमको जैसी सहकारी खाद संगठनों ने किसानों को जमीन से प्यार करने और उनके पोषण पर ध्यान दिलाने के लिए खासा काम किया है। मिट्टी की उर्वर क्षमता की जांच के बढ़ते प्रचलन ने इन प्रयासों को और आगे बढ़ाया है।

नतीजा सबके सामने है। आज किसान अपनी जमीन की उर्वरता के लिहाज से खाद का इस्तेमाल करने लगा है। एक ही खाद का इस्तेमाल करने के बजाए अब किसानों का जोर पोषण आधारित खादों पर होने लगा है। खाद कंपनियों के आंकड़े बताते हैं कि खेतीहर जमीन में जिंक, सल्फर, मैग्निशियम, पोटैशियम जैसे खनिजों और पोषक तत्वों की कमी दूर करने को लेकर किसान जागरूक हुआ है और इस तरह की खादों का इस्तेमाल बढ़ा है। खाद कंपनियों के बिक्री आंकड़ों से भी यह स्पष्ट हो रहा है कि किसान अब सिर्फ अपनी पैदावार बढ़ाने को उत्सुक नहीं है। बल्कि वह जमीन पर भी अपने परिवार के किसी सदस्य की तरह ध्यान दे रहा है। इसलिए जिस किसान की जमीन में जिस पोषक तत्व की आवश्यकता है, उसके लिए विशेष खाद का इस्तेमाल वह कर रहा है। जमीन को स्वस्थ और सेहतमंद बनाए रखने की चिंता ने किसान की मनोदशा में बड़ा बदलाव किया है।

अब एक नजर आंकड़ों के लिहाज से जमीन की सेतह पर। पोषण के लिहाज से पूरे देश की खेती लायक जमीन नाइट्रोजन की कमी से बुरी तरह जूझ रही है। यह समस्या पूरे देश में एक समान है। जांच के दौरान किसी किसी जगह पर तो 89

फीसद नमूनों में जमीन में नाइट्रोजन की कमी पाई गई है। इसी तरह फास्फोरस की कमी 80 नमूनों में मिलती है। पोटैशियम और सल्फर की कमी भी जमीन में लगातार बढ़ रही है। जहां तक जमीन के माइक्रोन्यूट्रेंट का सवाल है। जिनमें मुख्यतः खनिज आते हैं, उनकी कमी भी चिंताजनक स्तर को पार कर रही है। साल 2009-10 के इफको के एक अध्ययन के मुताबिक जांच के दौरान जमीन के 48 फीसदी नमूनों में आश्चर्यजनक तरीके से जिंक की कमी पाई गई है। इससे कुछ कम चिंताजनक हाल बोरोन, आयरन और मैग्निशियम का है। लेकिन इन आंकड़ों से यह स्पष्ट हो जाता है कि जमीन में पोषक तत्वों की अभूतपूर्व तेजी से कमी हो रही है।

कुछ कृषि वैज्ञानिक तो यह भी मानते हैं कि एक तरफ जमीन में पोषक तत्वों की तेजी से कमी हो रही है तो बीते तीन-चार दशकों में यूरिया के इस्तेमाल से यह स्थिति उत्पन्न हो गई है कि आज की तारीख में जमीन में जरूरत से ज्यादा यूरिया की मौजूदगी है। खेती के जानकारों का मानना है कि देश के कई इलाके तो ऐसे हैं जहां अगले कुछ वर्षों तक खेती के दौरान यूरिया डालने की आवश्यकता ही नहीं है। यही वजह है कि जागरूक किसानों ने अब यूरिया से मुंह मोड़ लिया है। बल्कि लोगों ने पोषक तत्वों पर आधारित खाद का इस्तेमाल बढ़ा दिया है इस तरह की विशिष्ट खादों के मामले में जिंक युक्त खाद का इस्तेमाल सबसे ज्यादा हो रहा है। इसी तरह जमीन में फास्फोरस और पोटैशियम की मात्रा बढ़ाने के लिए किसानों ने इन तत्वों से संबंधित खाद का इस्तेमाल करना भी शुरू किया है।

इसमें सरकार की भूमिका भी काफी महत्वपूर्ण है। सरकार की खाद सब्सिडी की नई नीति में पोषक तत्व आधारित खादों को बढ़ावा देने का फैसला लिया गया है। सरकार ने अपनी नई सब्सिडी नीति में उर्वरकों के बेहतर और प्रभावी इस्तेमाल को प्रोत्साहन जैसे बिंदु शामिल किए हैं। जिनका असर अब दिखने लगा है। जमीन की पोषकता



आज किसान अपनी जमीन की उर्वरता के लिहाज से खाद का इस्तेमाल करने लगा है। एक ही खाद का इस्तेमाल करने के बजाए अब किसानों का जोर पोषण आधारित खादों पर होने लगा है। खाद कंपनियों के आंकड़े बताते हैं कि खेतीहर जमीन में जिंक, सल्फर, मैग्निशियम, पोटैशियम जैसे खनिजों और पोषक तत्वों की कमी दूर करने को लेकर किसान जागरूक हुआ है और इस तरह की खादों का इस्तेमाल बढ़ा है। खाद कंपनियों के बिक्री आंकड़ों से भी यह स्पष्ट हो रहा है कि किसान अब सिर्फ अपनी पैदावार बढ़ाने को उत्सुक नहीं है। बल्कि वह जमीन पर भी अपने परिवार के किसी सदस्य की तरह ध्यान दे रहा है। इसलिए जिस किसान की जमीन में जिस पोषक तत्व की आवश्यकता है, उसके लिए विशेष खाद का इस्तेमाल वह कर रहा है।

में कमी को देखते हुए सरकार की योजना अधिक से अधिक बंजर जमीन को खेती योग्य भूमि में तब्दील करने की है ताकि मौजूदा खेतीहर जमीन पर दबाव कम किया जा सके। अभी देश को खाद्यान्न में आत्मनिर्भर बनाए रखने के लिए मौजूद खेतीहर जमीन पर पूरा दबाव है। इसलिए एक तरफ इस जमीन में उर्वरकों के बेहतर और प्रभावी इस्तेमाल को बढ़ावा देते हुए कुशल खेती प्रबंधन की कोशिशों में सरकार जुटी है तो दूसरी तरफ खेती के लिए नई जमीन के इस्तेमाल के उपाय कर रही है।

दरअसल अब तक इस तरह की खादों

के इस्तेमाल को लेकर किसानों के बीच कई तरह के भ्रम भी रहे हैं। ऐसा नहीं है कि किसानों का यह भ्रम पूरी तरह समाप्त हो गया है। लेकिन खाद कंपनियों और सरकार के प्रयासों ने इन भ्रमों को काफी हद तक कम भी किया है। मसलन एक भ्रम किसानों में इस तरह के उर्वरकों के उपयोग पर आने वाली लागत को लेकर है। आमतौर पर किसान मानते हैं कि वाटर साल्यूबल फर्टिलाइजर का इस्तेमाल पारंपरिक रसायनिक खादों की तुलना में महंगा पड़ता है। साथ ही इनके इस्तेमाल करने पर शुरूआत में सिंचाई साधनों समेत अन्य उपायों पर भारी निवेश की दरकार है। यह भी माना जाता है कि खेती को पूरी तरह इन उर्वरकों पर डालना किसानों की लागत में अभूतपूर्व वृद्धि करता है। लेकिन कंपनियों और सरकारी विभागों के प्रयासों से जिन किसानों ने इसे अपनाया है उनका यह भ्रम टूटने लगा है। अंततः खेती की पैदावार और उससे होने वाली आमदनी इस लागत से कहीं अधिक लाभकारी साबित हुई है। सरकार की तरफ से मिलने वाली सब्सिडी ने भी इसकी काफी हद तक भरपायी की है। लेकिन यह अभी शुरूआत है और इन प्रयासों को अभी न केवल जारी रखने की जरूरत है बल्कि इसे एक अभियान की तरह चलाये जाने की आवश्यकता है ताकि खेती लायक जमीन को फिर से पूर्णतः उपजाऊ बनाया जा सके।

इस दिशा में मौजूदा केंद्र सरकार की "लैंड सायल कार्ड" की नीति भी काफी प्रभावी साबित हो रही है। खाद कंपनियों, कृषि केंद्रों और सरकारी विभागों से इस तरह की सूचनाएं मिल रही हैं कि किसान अपनी जमीन की उर्वरता की जांच के लिए अब खुद आगे आ रहे हैं। किसानों द्वारा जमीन का रिपोर्ट कार्ड तैयार कराना एक सकारात्मक संकेत है, क्योंकि उर्वरकों का संतुलन ही आने वाली पीढ़ियों के लिए सेहतमंद और स्वस्थ जमीन उपलब्ध कराएगा। जब जमीन स्वस्थ और पोषक होगी तभी वह हमें पोषक अनाज दे पाएगी जो मनुष्य के जीवन को भी स्वस्थ रखेगी। ■■■

FACT Engineering Works

(A Division of the Fertilizers & Chemicals Travancore Ltd. Kochi)



Kurien Abraham
Dy. General Manager, FEW

FACT Engineering Works (FEW), a pioneer in fabrication, has a legacy spanning more than 45 years in the field of fabrication. FEW is a part of the multi-divisional company, the Fertilizers And Chemicals Travancore Limited (FACT), a Government of India Enterprise located in Kochi, Kerala under the administrative control of the Department of Fertilizers in the Ministry of Chemicals & Fertilizers. Started in 1966, as a part of diversification of FACT into the engineering field, FEW has evolved to a level of excellence in the fabrication field over a period of time. The unit is located at Palluruthy, in Kochi, in an area of around 14 acres, on the bank of Cochin backwaters. The firm has been serving the cause for quality engineering products, for various industries and organizations.

Clientele of FEW

Being a pioneer in the field of fabrication, starting from 1966, FEW had the opportunity to work with diversified Clientele in the process industry, engineering industry and for other institutions. FEW has to its credit many highly challenging works done for organizations like Bharat Petroleum Corporation Ltd

(BPCL-KR, Chennai Petroleum Corporation Ltd (CPCL), Kerala Minerals & Metals Ltd (KMML), Kerala Water Authority (KWA), Oil & Natural Gas Corporation (ONGC), Cochin Shipyard Ltd. (CSL), Kerala State Electricity Board (KSEB), Madras Fertilizers Ltd (MFL), Mangalore Refinery & Petrochemicals Ltd (MRPL), Fertilizers & Chemicals Travancore Ltd (FACT), NPOL (National Physical & Oceanographic Laboratory (NPOL), Fluid Control Research Institute (FCRI) etc.

Range of products manufactured by FEW

FEW has the capacity to design and manufacture various equipment as noted below:

- Heat exchangers



- Pressure vessels
- Penstocks
- Columns & towers
- Driers/granulators
- Storage tanks
- Heating/cooling coils
- Expansion bellows
- Hatch covers
- Crane posts
- Industrial fans
- Economisers for boiler

Major jobs executed by FEW

Though recognised as a Boiler manufacturer by the Indian Boiler Regulations authority, FEW was mainly focussing on Economisers, Steam coils & Steam lines etc. under the IBR category jobs. Recently, FEW has moved into the field of Waste Heat Boilers with the manufacture and installation of Waste Boilers for FACT. Another Boiler for FACT – Cochin Division is also under fabrication. In addition of the above, FEW has recently diversified into the maritime field with the construction of an Ammonia Barge for transporting Ammonia to the different divisions of FACT. The inspection & classification agency for the Barge is M/s Indian Register of Shipping (IRS)

Specialized equipment available in the shop

Plate bending machines:	For bending 20mm, 40mm, 60 mm thk plates
CNC drilling machine:	For drilling upto 50mm thk & Boring 80 mm thk.
Stress Relieving Furnace:	Size : 3.35m x 3.6m x 10 metres long
Press brake:	200 T
Section bending m/c:	For bending structural up to 200 mm
Submerged Arc welding equipment:	2 nos
EOT cranes:	10T, 15 T
Yard Crane:	24 T
Other equipment include manual drilling machines, Lathes, Shearing machine, Power- saw, welding equipment etc.	

FEW has done nearly 18 km of 900 mm - 1100 mm dia cement lined drinking water lines for Kerala Water Authority

Fabrication Facilities in FEW

The fabrication shop of FEW is located in Palluruthy, Kochi. It has a covered area of 4700 Sqm in different bays with EOT cranes for lifting and handling materials & products.

Quality Control Facilities

FEW has a full-fledged Quality Assurance Department staffed by engineers qualified in ASNT level I, II etc. to ensure quality & compliance to engineering codes and standards. FEW conduct destructive as well as non-destructive tests such as Radiography, Ultrasonic testing, Magnetic particle testing, Dye penetrant testing etc to ensure the quality of products.

Strengths of FEW

- Has a highly experienced team of engineers assisted by a pool of skilled and dedicated workers with a proven track record, enabling it to undertake the



many high quality works in the fabrication sector. Vast experience in executing specialized jobs such as Heat exchangers, pressure vessels, Ammonia storage tank, stacks, Waste Heat Boilers, Ammonia Barges and also execution of project jobs such as laying of cross country pipelines, offsite piping etc.

- Has a Quality assurance department having ASNT qualified engineers having various NDT instruments for conducting different NDT examinations of jobs.
- Availability of specialized machinery / equipment such as CNC Drilling Machine for

precision drilling, Press brake, section forming machine, Stress Relieving Furnace etc.

- Has a slipway which is being utilized for the launching of barges fabricated in FEW. The large water frontage available near the shop is used for the movement of fabricated items in barges to different destinations, through the inland waterways.

- FEW has to its credit of executing jobs under various external inspection agencies for ensuring the highest quality standards. The Inspection agencies include Det Norske Veritas (DNV), Lloyds Register (LR), American Bureau of Shipping (ABS), Bureau Veritas (BV), Indian Register of Shipping (IRS), Engineers India Ltd (EIL), FACT Engineering & Design Organization (FEDO) etc

- FEW has also the advantage of back up from FACT's manufacturing divisions by way of personnel, training and expertise in areas ranging from operation maintenance, electrical, instrumentation, Computers etc.

Recognitions & Approvals

- In 1998 FEW was awarded ISO 9001 certification by M/s DNV. This has been periodically upgraded every three years through re-certification audits. The existing certificate under ISO 9001-2008 is valid up to December 2015 and re-certification activity is under process.

- FEW is recognized by the Department of Explosives, GOI as an approved manufacturer of Unfired Pressure Vessels, under SMPV(U) rules.

- FEW fabrication shop is also approved by Indian Boiler Regulation Authority (IBR) for carrying out IBR jobs. ■■■

FACT Engineering & Design Organisation (FEDO)

-Dedicated to High Quality Engineering, PMC & Executing Agency Services



KT Mariamma
GM (Process), FEDO

FACT Engineering & Design Organisation (FEDO), located in Kochi (Kerala), is a premier engineering consultancy organisation in India today, engaged in design, engineering and implementation of projects in Fertilizers, Oil & Gas, Petrochemicals and Allied industries. We are apart of a multi-divisional company, the Fertilizers And Chemicals Travancore Limited (FACT), a Schedule 'A' Government of India Enterprise under the administrative control of the Department of Fertilisers in the Ministry of Chemicals & Fertilisers. Since its inception in the year 1965, FEDO has been serving the cause of the growing demand for quality engineering and project management services in the rapidly industrializing economy of India, with a great degree of distinction and sincerity of purpose.

Bouquet of Services offered by FEDO

- Pre-project activities like preparation of Techno Economic Feasibility Reports (TEFR), Detailed Project Reports (DPR), pipeline route survey, sourcing, selection and transfer of technology from Process Licensors of repute, and assisting clients in liaising

with statutory bodies and project financing agencies;

- Supply of know how and basic engineering design packages (BEDP) for Sulphuric Acid Plant based on elemental Sulphur, SO₂ gas from metallurgical plants and Alkali scrubbing system (Startup Scrubbing) for Sulphuric Acid Plant;
- Preparation of FEED (Front End Engineering Documents) including Offsite facilities, raw material and product storage & handling facilities;
- Preparation of basic engineering package for commercialized plants based on pilot plant data and Reverse Engineering for existing plants incorporating latest developments in material of construction, instrumentation, safety requirements etc.
- Carrying out residual process engineering and detailed engineering, based on process know-how and BEDP sourced from Process Licensors;
- Procurement assistance, construction supervision and commissioning assistance during the project execution stage;
- Inspection services, including third party inspection and expediting services;

- Project management services including planning, cost control and associated MIS;
- Maintenance and troubleshooting services for running plants;
- Undertaking revamp and retro fit of ailing plants;
- Conducting Electrical System/Power System Analysis using E-TAP Software;
- Conducting HAZOP and HAZAN studies, disaster management studies, lightning protection adequacy studies etc. for existing plants;
- Safety and Fire Engineering services.

Fields of Operation

FEDO has to its credit, engineering and project implementation expertise spread across diverse sectors of the industry over the past five decades, viz.

- Fertilizers: Ammonium Sulphate, Mono and Di Ammonium Phosphate, Urea, Complex Fertilisers etc.
- Petrochemicals: Caprolactam, Phenol, Methanol, etc.
- Oil and Gas : Crude Oil and Product Tankages, Oil Depots, LPG Bottling Plants, Design Appraisal of Floating Roof Tanks,

Natural Gas Distribution System, Fire Water Network System etc.

- Intermediate Chemicals: Sulphuric acid, Phosphoric acid, Ammonia, Hydrogen etc.

- Infrastructure development: National Highways, Industrial parks, Textile parks, Video Park, IT Park, Industrial Infrastructure, Academic Campus, Residential Township facilities etc.

- Offsite Facilities and Utilities: Raw Material / Product storage and handling systems, EHV power receiving and distribution stations, Plant & non-plant buildings and Industrial townships.

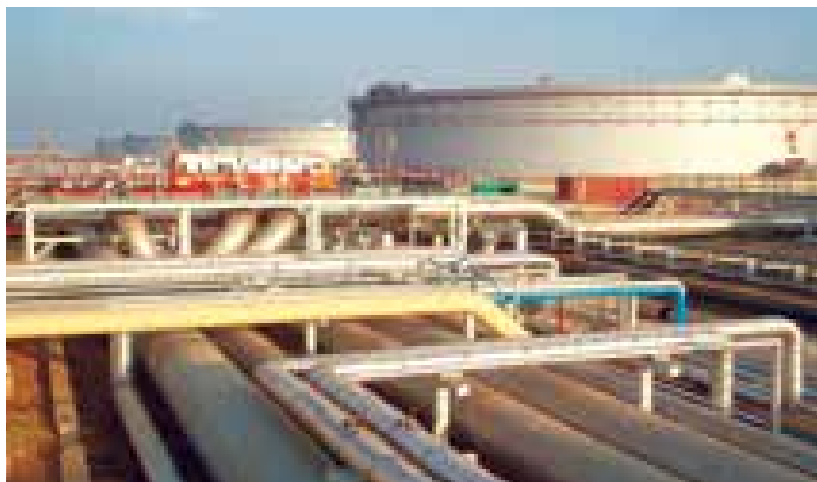
- Fire & Safety Engineering: Setting up of Fire fighting facilities, Safety systems, Upgradation and augmentation of existing Fire installations based on latest OISD guidelines.

- Health Study, RLA Study & Weak Area Analysis: Carrying out Health Studies, Residual Life Assessment and Weak Area Assessment for Process and Fertilizer plants.

Clientele of FEDO

Over the years, FEDO has actively participated in the industrialization process by associating with firms in public, private, joint and cooperative sectors to set up viable units in a most time bound manner. The sector wise list of our clients is as follows:

- Oil, Gas and Refining Sector: Oil & Natural Gas Corporation Limited, GAIL India Limited, Indian Oil Corporation Limited, Hindustan Petroleum Corporation Limited, Bharat Petroleum Corporation Limited, IBP Co. Limited, Chennai Petroleum Corporation Limited, Kochi Refineries Limited, Oil



Crude Tank Farm IOCL Paradip Refinery, Odisha

India Limited, MRPL.

- Fertilizer Sector: Krishak Bharati Co-operative Limited, Indian Farmers' Fertiliser Cooperative Limited, Madras Fertilizers Limited, Fertiliser Corporation of India Limited, Hindustan Fertilisers Corporation Limited, Southern Petrochemical Industries Corporation Limited, Tuticorin, Alkali Chemicals Limited, Paradeep Phosphates Limited, Pyrites Phosphates & Chemicals Limited, Indo Gulf Fertilisers & Chemicals Corporation Limited, Hindalco, Gujarat, Oswal Chemicals & Fertilizers Limited, Paradeep, National Fertilisers Ltd, Panipat, Batinda & Nangal, Rashtriya Chemicals and Fertilisers Ltd, Mumbai, Gujarat State Fertilizer Corporation, Gujarat Narmada Valley Fertilizer Corporation Limited, Mangalore Chemicals & Fertilizers Limited.

- Other Chemical Industry: Hindustan Organic Chemicals Limited, Hindustan Zinc Limited, Hindustan Copper Limited, Kerala Chemicals & Proteins Limited, Travancore Titanium Products Limited, Binani Zinc Limited, Hindustan Lever

Limited, Hindustan Insecticides Limited, Indo-German Carbons Limited, Kerala Minerals and Metals Ltd., Indian Rare Earth Ltd., Heavy Water Board Mumbai etc.

- Infrastructure Sector: Kerala Infrastructural Development Corporation, KINFRA Export Promotion Industrial Parks, Kerala State Industrial Development Corporation, Roads & Bridges Development Corporation of Kerala Ltd., Goshree Island Development Authority etc.

Recent Flagship Projects done by FEDO Feedstock & fuel conversion project of ammonia plant for fact

PMC for the revamp of the 900 TPD Ammonia Plant of FACT for feedstock and fuel change over from naphtha to RLNG.

The scope of the project consists of preparation of DPR, PMC & Engineering Services upto Commissioning for the revamp of the 900 TPD Ammonia Plant and laying of pipe line for receiving LNG and distribution.

As part of implementing the job of revamping of Ammonia plant for



Crude Pump House IOCL Paradip Refinery, Odisha

feed stock conversion, services of Process licensor M/s HTAS were availed. LNG Pre Heater E-207, SO₂ Absorber R-202A, LNG Heater H-206, R-LNG Heater E-5102, LNG Heater E-5101, Gas separator S-5103 & Water seal drum S-5104 are the main equipments erected in this project.

The commissioning of the LNG feed conversion project was carried out successfully during the period 25/09/2013 to 05/10/2013. The plant which was running on Naphtha was slowly changed over to RLNG on line and the process of change over was completed on 05/10/2013. Ammonia plant can run on Naphtha /RLNG or on mixture of Naphtha vapour and RLNG.

Crude and Product Tankage Facility Project For IOCL Paradip Refinery

Consultancy Services for implementation of Crude and Product Tankage for IOCL Paradip Refinery Project at Paradip, Orissa (India) on BOOT (Build-Own-Operate-Transfer) Basis.

Phase-I

Development of BOOT Model,

Pre-qualification of bidders, Preparation of Tender Documents for BOOT work, Techno Commercial Evaluation for Bids, Price bid Evaluation and Recommendation for Award of Work, Preparation of Contract Agreement Documents

Phase-II

Review of Detailed Engineering Documents, Review of Documents for Procurement, Construction Management & Supervision involving Civil, Mechanical, Electrical and Instrumentation, Progress Monitoring, Quality Control of Site Activities, HSE Activities at Site, Final Certification on completion of facility.

The BOOT-3 Package is for Installation and Operation of

- 36 Nos. Floating Roof / Cone Roof Tanks of diameter upto 79 Mtrs
- 15 Nos. Mounded Bullets of size 6.4 M Dia x 93 M length
- Connected facilities – Pump houses, Control rooms etc.
- Pig launchers : 9 Nos.
- LT Flare system : (1 + 1 Standby) Demountable Type, Flare Rate

:207000 kg/h, Height : 76.5 m & Riser Pipe Size: 600 NB

- ICS Package, Fire & Gas System, Emergency System / Gas Detection System
- Tank Gauging System, Terminal Automation System & Tank Farm Management System (TFMS)
- No. of Custody Transfer Metering Skids (CTMS) = 11 Nos.
- Rim Seal Fire Protection System for floating roof tanks
- No. of Cathodic Protection System Package = for 51 Tanks / Bullets
- Blast resistant control room, Operator's cabin, Substations etc

The project cost as per the initial estimate was around Rs.2700 crore.

Crude Oil Receipt Facilities Project of M/s. BPCL, Kochi Refinery

Better known as the Single Point Mooring Project (SPM) for unloading of VLCCs off the coast of Kochi, the first of its kind in Asia, FEDO was the PMC for setting up the on-shore tank farm, pumping facilities, cross-country crude and product pipelines, fire installations and associated facilities for this prestigious project. The project cost for the on-shore part was to the tune of Rs.300 crore. The Tank Farm was commissioned in December 2007. An extension of the tank farm in the form of addition of one more double deck floating roof crude oil tank was also entrusted to FEDO in 2009 for a fee of Rs.98 lakh.

Health Assessment & RLA Study for Ammonia/Urea Plants

- The client was M/s. KRIBHCO,

Surat. The study was completed and final report submitted by FEDO in March 2010 well ahead of the scheduled date of submission.

- FEDO had conducted Health Study of Ammonia-Urea complex of M/s NFL Panipat; NFL, Batinda; NFL, Nangal and GNFC

Benchmark study for KMML, Chavara Titanium Dioxide Pigment Plant

FEDO has successfully completed the KMMLs Titanium Dioxide (TiO₂) Pigment Plant. The work involves:

- Study to TiO₂ Plant and its intermediate products to fix the capacity of each unit and suggesting an optimum plant capacity.
- Updation of PFDs to reflect the validated capacity.
- Cost and productivity Benchmarks and detailed cost analysis in line with global TiO₂ producing companies.
- Analysis of correct usage ratios with benchmark values
- Detailed contribution analysis of various grades of TiO₂.

DFR on Skin Effect Heat Traced Pipeline Systems

FEDO has successfully completed the preparation of Detailed Feasibility Report for Laying an Underground Skin Effect Heat Traced Pipeline from South Tanker Berth (STB) at Ernakulam to BPCL-KR Ambalamugal. In Skin-Effect Current Tracing (SECT) is based on Proximity effect, whereby heat is generated on the inner surface of a ferromagnetic heat tube that is thermally coupled (welded) to the pipe to be heat traced. BPCL-KR is implementing Integrated Refinery



HVLRM – Fire Fighting Facility IOCL Paradip Refinery, Odisha

Expansion Project (IREP) to enhance the refining capacity to 15.5 MMTPA. The laying of pipeline is necessitated because on completion of the IREP, the fuel requirement of the integrated refinery increases as there will be no more Furnace Oil (FO) production and the fuel gas generated and CLO available will not be sufficient to meet the entire fuel requirement of the integrated refinery. Thus, the fuel requirement has to be met by importing LSFO and LSHS. Since the pour point of LSHS is 60°C, maintaining the temperature above pour point is essential during transport. In order to transport LSHS reaching at STB in heated oil tanker, a heat traced pipeline is to be laid from South Tanker Berth jetty to the Refinery.

As part of the work, FEDO has carried out the Heat load calculations, Optimum pipeline sizing, Surge Analysis, Route survey, Cadastral survey, and Financial analysis.

Liquid Ammonia Transportation Barge

Preparation of P&ID for loading/unloading of ammonia meeting all the safety stipulations.

Mechanical design of the Ammonia Bullets in conformance to ASME Sec. VIII, Div. 1 and IRS rules, review of FEW's fabrication drawings and technical support for IRS approval. Charting a roadmap for the project and tying-up with Dept. of Ship Technology – CUSAT for basic engineering of the barge. Firming up the barge type, overall dimensions and technical specifications for the barge construction contractor in association with DOST – CUSAT.

Projects on hand

- Project Management Consultancy (PMC) services for Terminal Automation, CCTV Surveillance system at various terminals of IOCL in Tamil Nadu, taking into consideration prevailing functional/technical requirements, already imposed/upcoming safety requirements by M B Lal Committee and other statutory bodies, Industry Working Group / Joint Industry Committee recommendations/OISD standards.

- Project Management Consultant (PMC) for laying new fire water network at ONGC Hazira by replacing the existing



Crude Area Control Room IOCL Paradip Refinery, Odisha

network (including valves, piping, fittings, hydrants monitors etc.) with a new over ground (at an elevation of min 300 mm above FGL) Fire water Network in entire Hazira Plant as per OISD standards.

- Supply and installation of electrics for electrical power distribution for Cochin University of Science and Technology (CUSAT) Radar Facility. The scope of work includes supply and installation of a 11kV Double Pole structure for power receiving with all accessories, 630kVA Unitized substation, Capacitor control panel with power capacitors, MV switchboards, Fire Alarm System, Distribution boards, UPS system, HT and LT power cables, power supply units for TR Modules, Copper bonded earthing system, ESE lightning protection system, indoor and outdoor lighting, structural works .

- Consultancy services for Project Management, Basic Engineering & Detailed Engineering for 8 Nos. of Mounded bullets for Propane and Butane having capacity of 1925 MT each, Associated Civil, Electrical, Instrumentation,

Piping, Firefighting facilities etc. Cost estimates, Preparation of tender packages, Construction Management, Site Supervision including assistance in startup, commissioning & performance test runs for LPG Import Terminal for IOCL at Kochi.

- Project Management and Consultancy Services for Setting up facilities for Residential Township for BPCL-KR at Kochi, Kerala. FEDO's Scope of work includes Architectural services, Design and detailed Engineering, Project Management Services & Planning, Construction Management and Supervision, Quality Assurance, Griha Certification and Commissioning of facilities.

PMC service for Crude Oil Storage at STF, Puthuvypeenfor BPCL-KR, Kochi.

The scope of the project consists of design, procurement, fabrication, installation and commissioning of one Double Deck Floating Roof Crude Oil storage Tank having size of 79m diameter and 18m height and connected facilities

at Shore Tank Farm (STF), Kochi. This is a repeat order from BPCL-KR. FEDO had been the PMC for the other four tanks of similar capacity existing at STF.

PMC for Construction & Infrastructure Development(Phase-II) at NIT, Dimapur, Nagaland.

NIT is setting up its campus in 300 acres of land located at Chumukedima, Dimapur district, of Nagaland. This project includes the construction of Academic buildings, Administrative buildings, Residential buildings, and utility buildings. FEDO's scope of work includes Development of Master Plan, Architectural Planning and Design, Project Management Consultancy Services, Regular Supervision and Monitoring of work progress. This is another feather in the cap of FEDO in the infrastructural field where it has a very strong presence now.

SSP Technical Audit

FEDO was awarded the work of Technical Audit of SSP Units in the States of Maharashtra (15 Units), Andhra Pradesh (9 Units), Karnataka (2 Units) and Tamil Nadu (3 Units), during July 2012 by Department of Fertilizers, GoI. The work involves monitoring of quality of rock phosphate, Technical inspection of SSP units to ascertain whether the units are working as per tenets of NBS Policy, first time inspection of newly set up SSP plants and certification of new rock phosphate / blending combination.

FEDO's Strengths

- A considerable pool of

technically qualified manpower drawn from across all the major engineering disciplines, with a fine blend of youth and experience.

- A high degree of computerization across the board. All terminals in FEDO are connected through high speed LAN servers for faster sharing of information and collaborative design work. Externally, there is 24/7 Broadband connectivity to facilitate quick real time receipt/transmission of documents from/to our clients. It also makes e-tendering possible.

- State-of-the-art design, engineering and project management software are made use of to enable us complete our projects in the most cost effective and time-bound manner. Through a process of continuous up-gradation, we take care to keep these software up-to-date. Some of the softwares used by FEDO are: (1) Design-II(Process Simulation), (2) Hydronet (Network Analysis of Fire Water),(3) Aspen HTFS+ (Thermal Design of Heat Exchangers), (4) Caesar II (Stress Analysis), (5) PipeNet(Surge Analysis), (6) Cadworx(3-D Modelling), (7) P V Elite,version 2008 (Design of PressureVessels), (8) TANK, Version3.00 (Design of Storage Tanks),(9) STAAD Pro V8i (StructuralAnalysis), (10) PRIMAVERA P6(Project Management), (11) MSPROJECT 2007, (12) ETAP Version7.0.1 (Power System Analysis),(13) AutoCad 2010 (Available in all Engineering departments-for Drafting), (14) 'Smart Plant Instrumentation'. In addition to the above, 'Windows 7'



LPG Mounded Bullets Storage Facility IOCL Paradip Refinery, Odisha

(OS), Internet Explorer 8.0 and AdobeAcrobat Writer 9.0 have been installed in all our PCs.

- FEDO is probably the only engineering consultancy organization in India to have the opportunity to be intimately associated with the operation and trouble shooting of various chemical, acid, fertilizer and petrochemical plants, owned and operated by our parent company, The Fertilisers And Chemicals Travancore Limited (FACT). Many of these plants, engineered and executed by FEDO, span across generations of technology and are still running as on this date. This has endowed us with several key advantages:

- Over the years, FEDO has been able to gain invaluable insights with regard to commissioning, performance guarantee run and trouble shooting of acid, chemical, petrochemical and fertilizer plants.

- The practical insights gained by virtue of our close association with the operating plants belonging to the sister divisions of FACT Limited, have informed our

design and engineering philosophy in a most positive manner. As a result, our plant designs turn out to be highly energy efficient, safety conscious, as well as operation and maintenance friendly.

Association with Global Process Licensors

In course of our five decades of project engineering experience, both for in-house as well as external projects, FEDO have had the opportunity to work alongside some of the most prominent names among the global technology giants in the process industry. Some of the names worth mentioning would be: Haldor Topsoe of Denmark, Toyo Engineering Corporation of Japan, Stamicarbon of The Netherlands, Chiyoda of Japan, UOP Incorporated of the USA, MW Kellogg of the USA, Urea Casale of Switzerland and Lurgi of Germany among others. Needless to say, this has helped FEDO to gain valuable insights into aspects of modern engineering & design and made us conversant with the nitty gritty of international work environment.

46th Indian Labour Conference

Prime Minister Calls for Efforts to Modify Laws through Consensus



Seen in the photograph are Hon'ble Prime Minister Shri Narendra Modi, Shri Arun Jaitley, Union Minister of Finance, Shri Bandaru Dattatraya, Union Minister of State (IC) for Labour & Employment, Capt. Abhimanyu, Minister of Labour, Govt. of Haryana and Shri R. G. Rajan, Chairman, SCOPE.

The 46th Session of the Indian Labour Conference was organized by the Ministry of Labour & Employment on 20th-21st July 2015 at Vigyan Bhawan, New Delhi. Prime Minister Shri Narendra Modi inaugurated the Conference. On this occasion, Prime Minister dedicated National Career Service (NCS) Portal and launched ESIC 2.0: Reform Initiatives of ESIC.

Shri Arun Jaitley, Union Minister of Finance, Shri Bandaru Dattatraya, Minister of State (IC) for Labour & Employment, Shri Shankar Agarwal, IAS, Secretary (Labour & Employment), Shri R.G. Rajan, Chairman, SCOPE & Vice Chairman, Employers Delegate and Shri Baij Nath Rai, General Secretary, Bhartiya Mazdoor Sangh also addressed the inaugural session of the Conference.

Earlier, Shri R.G. Rajan, Chairman, SCOPE and Chairman, Council of Indian Employers (CIE) was unanimously elected as Vice Chairman of the Employers Group and represented the entire employers (public sector and private sector) in the 46th Indian Labour Conference.

Prime Minister Shri Narendra Modi while inaugurating the 46th Indian Labour Conference (ILC) called for tripartite cooperation and for making every effort to modify laws through consensus. Shri Modi stressed the need for developing family bond like relations between employee and employer. He said this will not only strengthen economy of the



Hon'ble Prime Minister Shri Narendra Modi addressing the 46th Indian Labour Conference.

country but will also ensure well-being of both entrepreneurs and workers.

Emphasizing that laws alone would not bring about the desired objective, the Prime Minister said it was the combined effort of the labour unions, the industrialists and the Government, which would lead to results which were in the interest of the nation's economy. The Prime Minister said successful examples of this kind are worth emulation. He said every effort would be made to modify laws through consensus. As part of the concept of "Minimum Government, Maximum Governance," the



Hon'ble Prime Minister said that every effort would be made to modify laws through consensus. As part of the concept of "Minimum Government, Maximum Governance," the Prime Minister said obsolete and unnecessary laws were being weeded out.

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Calling ILC as Labour Parliament of India, the PM said that India has experience of about 75 years relating to tripartite consultations and has taken several steps towards change through consultation and consensus. Change is a symptom of a vibrant system, he added. The PM said the line dividing the welfare of an industry and an industrialist; the welfare of the nation and the government and the welfare of labourers and trade unions is very delicate and needs to be treaded carefully. He suggested industrialists to contribute to Skill India by providing on job training to youth and promoting innovation and innovator. It is essential for Indian society to develop a consciousness towards "dignity of labour ", the Prime Minister said."

The Prime Minister said 4.67 crore workers now have a portable Provident Fund Account, through a Universal Account Number, which connects them to an online network. He also mentioned other welfare initiatives of the Government, such as raising minimum pension to Rs. 1000.

Speaking on the occasion, Shri Arun Jaitley, Union Minister of Finance and the Guest of Honour said India need to seize the opportunity arising out of prevailing global economic scenario. Earlier in his welcome address Shri Bandaru Dattatraya, Union Minister of State (IC) for Labour & Employment said that this conference is the right forum to underline the importance of labour in formulating framework of National Policy protecting the rights of workers. He informed



(L to R) Shri Arun Jaitley, Union Minister of Finance, Shri Bandaru Dattatraya, Union Minister of State (IC) for Labour and Employment and Shri R. G. Rajan, Chairman, SCOPE addressing the Inaugural Session of the 46th Indian Labour Conference.

the conference of various important initiatives implemented during the past one year.

In his address, Mr. R.G. Rajan, Chairman, SCOPE and Vice Chairman, Employers Group, put forth the industry's perspective on vital issues touching upon labour, employment and social policies, critical to economic and social development of the country.

Mr. Rajan said that the employers fully believed in universal social security which is a fundamental right. He said that the industry is already contributing more than one fifth of an employee's wages

towards the social security.

Chairman, SCOPE said that the laws framed mainly to cater the manufacturing sector, do not address the problems of the service sector which today accounts for 57 percent of the GDP. He said the outdated and rigid nature of labour laws protects a handful of say 6-7 percent of the workforce, seriously hampering employment generation capacity of the organized sector. This forces the 10-12 million youth joining labour force every year to join informal economy, where the working conditions are pathetic and earnings are also abysmally

low. Multiplicity of labour laws present operational problems in implementation and compliances that needs to be looked into, he emphasized.

The Conference was attended by a large number of representatives from government, employers and workers groups.

SCOPE, being one of the constituents of the Council of Indian Employers (CIE) represents public sector employers on all tripartite bodies constituted by the Ministry of Labour & Employment such as Indian Labour Conference (ILC), Standing Labour Committee (SLC), ESIC, EPF etc. ■■■



Address of Shri R G Rajan, Chairman, SCOPE, and Vice Chairman, Employers Group at the 46th Indian Labour Conference



Hon'ble Prime Minister of India
Shri Narendra Modi ji

Hon'ble Union Minister of Finance
Shri Arun Jaitley ji

Hon'ble Minister of Labour & Employment
Shri Bandaru Dattatreya ji

Hon'ble Minister
Capt. Abhimanyu, Labour
Minister of Haryana

Labour Secretary
Shri Shankar Agarwal ji

Hon'ble Labour Ministers of the State Governments

Vice-Chairman Workers Group
Shri B. N. Rai

Distinguished representatives of Trade Unions, Employers, Central and State Government Officials and invitees.

It is indeed a privilege to speak before this august gathering on behalf of the Indian Employers, putting forth the industry's perspective on vital issues touching upon Labour, Employment and Social Policies, critical to economic and social development of the country.

We thank the Union Labour Ministry for organizing the conference and believe that the address of Hon'ble Prime Minister would set the tone for a healthy and progressive debate, to harness the potential of social partners, to greater cause of nation building.

Sir, Tripartism has been a glorious feature of this country. The maturity of leadership of social partners was evident during a peaceful and smooth transition of economy. The issues confronting

us today are challenging but I am sure your dynamic leadership and pragmatism will guide the country to a dawn of new hopes, prosperity and peace.

Sir, we are debating today on Labour policy reforms which are due for a long time, as the context in which they were framed has changed drastically. The Laws framed mainly to cater the manufacturing sector, do not address the problems of the service sector, which today, accounts for 57 per cent of our GDP. The outdated and rigid nature of labour laws protects a handful of say 6-7 per cent of the workforce, seriously hampering employment generation capacity of the organised sector. This forces the 10-12 million youth, joining labour force every year, to join the unorganised sector, where the working conditions

Employers fully believe in the universal social security which we feel is a fundamental right.

Industry is already contributing more than one fifth of an employee's wages towards the social security.

We welcome discussion on social security for the unorganized sector. We are not averse to paying higher wages, social security or higher bonus but industry's capacity to pay should be kept in mind to maintain the level of employment.



need improvement and earnings are also low.

Multiplicity of labour laws – 44 Central and about 100 State Laws – present operational problems in implementation and compliances that need to be looked into. Besides, using different terminologies like employee, workman, worker to denote a worker or wages, basic wages, salary referring to the compensation, this has made labour legislation cumbersome and complex. We therefore, appreciate ongoing efforts to review and rationalize labour policies following your government’s commitment of ‘Maximum Governance’ with ‘Minimum Government’, transparency and accountability.

We compliment your Government for initiating necessary changes in processes such as the ‘Shram Suvidah portal’, launched a few days back, simplifying and cutting down cumbersome and time consuming paper work and filling of multiple returns involved in 8 Central laws. It will provide

substantial relief to MSMEs, who due to resource crunch, can’t hire skilled staff and are also subjected to high handedness

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of inspectorate. We also compliment the Government for launching National Career Service (NCS) portal.

We welcome the three new draft bills, introduced by the Ministry- the ‘Small Factories (Regulation of Employment & Conditions of Services) Bill, 2014’, the ‘Labour Code on Wages Bill, 2015’ and the Labour Code on Industrial Relations Bill, 2015. With some modifications, these legislations will for ‘factory’ be necessary to save the small cottage industries.

Sir, employers fully believe in the universal social security which we feel is a fundamental right. Industry is already contributing more than one fifth of an employee’s wages towards the social security. We welcome discussion on social security for the unorganized sector. We are not averse to paying higher wages, social security or higher bonus but industry’s capacity to pay should be kept in mind to maintain the level of employment.

With these words, I thank you for inviting me to address the conference. ■■■

Agenda and Recommendations of the Committees of the 46th Indian Labour Conference

The Indian Labour Conference (ILC) is the apex level tripartite consultative committee in the Ministry of Labour & Employment to advise the Government on the issues concerning working class of the country. All the 12 Central Trade Union Organizations, Central Organizations of employers, all State Governments and Union Territories and Central Ministries/ Departments concerned with the agenda items, are the members of the ILC.

As a matter of practice, and to maintain continuous dialogue with social partners, meetings of this apex body are convened once in a year to discuss the topical issues concerning labour. The first meeting of the Indian Labour Conference (then called Tripartite National Labour Conference) was held in 1942 and so far a total of 45 Sessions have been held. The 45th Session of Indian Labour Conference was held on 17–18 May, 2013.

The Standing Labour Committee (SLC), a tripartite body in its 47th Session on 10th July, 2015 after detailed deliberations finalized five agenda items for discussion in the 46th Indian Labour Conference.

The Ministry of Labour and Employment is implementing the National Career Service (NCS) Project by transforming the processes in the network of Employment Exchanges. The existing system of Employment Services follows ILO Convention 88 which mandates the Government to maintain a free Employment Service. The NCS

Sl. No.	Agenda Items
1.	Implementation of the conclusions/ recommendations of the 43rd, 44th and 45th Indian Labour Conference, particularly on Contract Labour, Minimum Wages and Scheme Workers and Tripartite Mechanism
2.	Social Security for Workers in Organized Sector, Unorganized Sector and Migrant International workers
3.	Amendment of Bonus Act – Removal of conditions on payment ceiling, eligibility limits, decisions to pay minimum bonus without linking to loss when the performance indicator satisfy grant of bonus
4.	Labour Laws amendments proposed/done either by the Central or State Governments
5.	Employment and Employment Generation

project envisages setting up of Model Career Centres (MCCs) in order to efficiently connect the youth with job opportunities with the help of technology and assisted by guidance. The Career Centres, supported by a national portal and a knowledge-rich career content repository, would demonstrate the efficacy of good employment services in terms of local demand supply assessment, career counseling, job matching etc. The Career Centres would focus on career education through career counseling.

The Health Reform Agenda is a comprehensive agenda package meant to transform the Public Service Delivery System in ESIC through effective use of Information and Communication Technology. The agenda comprises many transformative initiatives. Electronic Health Records will be created which can be seen by the I.P. and his family online. The records will also include Laboratory Report in digital format and there will be no need to visit hospital for getting this

information. In another initiative for quick service delivery the 24/7 Medical Helpline will be created and Doctors will be available to the I.P. directly. This Helpline will be toll-free and will also be available in regional languages. In a unique initiative under Swatch Bharat – Swasth Bharat Campaign of the Prime Minister, ESIC is going to take up a cleanliness drive across all the hospitals in the country through colour coding of bed sheets in the patient wards. This Operation Indradhanush will ensure the mandatory health and hygiene in ESIC hospitals across the country through a very simple and effective manner.

After the inaugural Session & general discussion, the Conference split into five Committees to have detailed deliberation on each of the five items of the agenda of the Conference. Each Conference Committee met separately to discuss the subject matter assigned to it in detail and present the conclusions arrived at therein for adoption in the Concluding Session of the Conference.

Conclusions of the Committee on Implementation of the conclusions/recommendations of the 43rd, 44th and 45th Indian Labour Conference, particularly on Contract Labour, Minimum Wages and Scheme Workers and Tripartite Mechanism

The Committee debated the recommendations of the 43rd, 44th and 45th Indian Labour conference at length and expressed its concern over non-implementation of the conclusions, particularly on Contract Labour, Minimum Wages, scheme workers

and Tripartism. It was therefore unanimously recommended that concrete measures should be undertaken to expeditiously implement the recommendations in letter and spirit. Periodic review should be undertaken by the stakeholders.

Recommendations of the Committee on Social Security for Organized, Unorganized and Migrant International Workers

There was an in-principle agreement for coverage of all workers organized as well as unorganized under social security with support wage by Government, if required, for providing decent living conditions. The Committee recommended that:

1. Mechanism for identification and registration of unorganized workers should be provided. Special drive should be launched for the said purpose and, if required, direct registration by the Government.

2. Schemes for organized/ unorganized workers should be made efficient.

3. Budgetary provisions should be made for those unorganized workers who are not covered under any specific social security scheme.

4. The cost of registration of unorganized workers should be borne by the Central/State Government.

5. There should be proper utilization of fund collected through building construction cess and administrative expenses should not be for what is not stipulated.

6. The Anganwadi/Asha/Mid-day meal and other such workers, the Committee reiterated that they should be extended coverage under ESI/EPF.

7. As regards ESIC, the following recommendations were given:

a) ESIC to expand to cover all States/UTs. All districts where scheme is running at present should be covered fully.

b) The ESIC scheme to be expanded to unorganized sector by reducing the threshold from present 10. Self employed should be provided medical benefit, in phases.

c) The ESIC should directly run the health services in all the States. States should not be asked to bear the cost of Medical Expenses.

d) Medical facilities should be expanded at a fast pace; establishments of hospitals and dispensaries should be decided based on geographical necessity.

e) All construction workers should be covered under ESI.

f) ESI coverage for round the clock for medical benefit.

8. As regards EPF, recommendations were:

a) Medical Scheme to EPS pensioners from the surplus Corpus of EDLI Scheme.

b) Extension of coverage by reducing threshold from 20 to 10.

c) Coverage of both inter-state and international migrant workers under EPF Act.

d) EPF pension should be enhanced and linked with price index.

9. Wages definition should be uniform for all labour laws.

10. There should be a mechanism so that employers can deposit social security contributions at single window.

11. For construction workers, there should be a single contribution from employer.

12. Implementation of the decision taken by 43rd, 44th and 45th ILC with regard to Social Security.

However, on the point of optional scheme for ESI & EPF, the employee's representatives strongly opposed whereas the employers representatives were of the view that options should be available.

Recommendations of the Committee on Removal of Conditions on Payment Ceiling, Eligibility Limits, Decisions to pay Minimum Bonus without Linking to loss when the performance indicator satisfy grant of bonus

The Conference Committee on Amendment of Bonus Act – Removal of conditions on payment Ceiling, Eligibility Limits, Decision to pay

Minimum Bonus without linking to loss when the performance indicator satisfy grant of bonus constituted to discuss the Agenda Item No. 3 of 46th

Session of the Indian Labour Conference met under the Chairmanship of Captain Abhimanyu, Hon'ble Minister of Labour, Govt. of Haryana. Shri Om Prakash Mittal, General Secretary, Laghu Udyog Bharti (LUB) and Ms. Meenakshi Gupta and Mr. B.B. Mallick, Joint Secretary, MoLE respectively were the Vice- Chairman and Member Secretary of the Committee. The Committee had the representation of all the stake- holders (Workers Group, Employers' Group and State Government).

2. At the very outset, the Chairman of the Committee welcomed all the representatives. He observed that the issue of bonus has been pending for long. He expressed the hope that all the partners would understand and appreciate the position of each other and give recommendations keeping in view the larger national interest. The Vice Chairman also welcomed all the members. Thereafter, the Member Secretary introduced the subject. The agenda has following three issues:-

- a) Removal of Calculation Ceiling;
- b) Removal of Eligibility Limit; and
- c) Decisions to pay Minimum Bonus without Linking to loss when the performance indicators satisfy grant of bonus.

3. It was mentioned that last revision in the limits (Calculation Ceiling- Rs. 3500 and Eligibility Limit- Rs. 10,000) was done in 2007 based on the recommendations of the 41st ILC.

4. The Committee had very intense and detailed discussions on all the aspects of the Agenda Item No. 3.

5. The major conclusions emanating from the discussions in the Committee are as follows:

- a) The Trade Unions were of the view that all the

ceilings under the Payment of Bonus Act, 1965 i.e. eligibility ceiling, calculation ceiling and maximum percent of bonus payable need to be removed. They further expressed that they would like to reiterate the stand taken by them in the Tripartite meeting held on 20 October, 2014.

- b) The Employers, representatives were of the view that total removal of various ceiling may lead to spurt in industrial relations issues. They observed that while making any change in the Payment of Bonus Act, 1965 productivity of the workers and paying capacity of the employers have to be taken into account. They further observed that they are not in favor of indexation of cost of living for the purpose of ceiling and bonus calculation. The term 'Employee' should be substituted by the term 'Workman' as defined under the Industrial Disputes Act. The present system of prescribing limits both for eligibility and calculation should be retained.

- c) The State Government representatives were of the view that minimum limit of bonus (8.33%) may continue. Regarding limits with regard to calculation and payment ceiling it was stated that they had no comments to offer. They further observed that distinction between statutory bonus and Productivity linked bonus is quite relevant in this regard.

- d) The State Government representatives also suggested that the Central Government may consider notifying the limits for eligibility of bonus and calculation of bonus through an administrative process based on tripartite mechanism rather than legislative process every time. Appropriate amendment to the Payment of Bonus Act, 1965 may have to be carried out accordingly.

Recommendations of Committee on Labour Laws Amendments proposed/ done by Central or State Governments

1. The Committee reiterates historical role of tripartite mechanism functioning in the country before any enactment/ amendment of labour laws.

2. Any labour law amendments/ enactments should take into account three purposes namely:

- a) Rights and welfare of workers;
- b) Sustainability of enterprises and job creation; and

- c) Industrial peace.

3. The Labour Laws need to be relooked and updated in a time bound manner.

4. Committee recommends that the overall exercise of the labour law amendments should be discussed in the tripartite forum and the broad and specific proposals should also be discussed in tripartite meetings.

Recommendations of Committee on Employment and Employment Generation

1. The committee noted that the recommendations of 43rd to 45th ILC on Employment & Employability need to be fully implemented.
2. Recognising the employment potential in micro and small industry, especially in rural areas, an effective single-window system be established to promote agro based and micro & small industries with facility like concessional finance etc. A system for centralized marketing of products manufactured by these industries can also be developed.
3. Enhance the outlays and threshold for public employment generation programmes in both rural and urban areas.
4. Fill up vacant posts in Central Government, State Governments and Public Sector Undertakings in a time bound manner.
5. Reiterate the necessity for publishing quarterly employment and unemployment data.
6. With Central and State Government moving to on-line systems for employment exchanges there is a need for capacity building of Employment Exchanges Officers for their revised roles under National Career Service (NCS). Need for integration of Central and State IT initiatives to avoid duplication.
7. Utilization of idle capacity in Vocational and Educational Institutions and closed/sick industry for demand responsive training.
8. Enhance and expand areas for Recognition of Prior Learning (RPL) with effective assessment.
9. Enhance number and improve quality of Assessors for Vocational Training and consider including ITI faculty for assessments.
10. To identify labour – intensive industries and new areas where jobs can be created like renewable energy and reusable resources etc. and providing employment linked training.
11. Evolve strategies for increasing female workforce participation in both public and private employment.



**Dr. U. D. Choubey,
DG, SCOPE
Meets
Mr. Ajit Kumar Seth
Chairman,
PESB**

DG, SCOPE Addresses CIC Conference of State Chief Information Commissioners

Dr. U.D. Choubey, Director General, SCOPE was invited to address the Conference of State Chief Information Commissioners held on 28th August, 2015 in New Delhi. Mr. Vijay Sharma, Chief Information Commissioner, Central Information Commission chaired the Conference which was attended by State CICs, former Information Commissioners, CIC etc.

While addressing the conference, Dr. U.D. Choubey said that RTI Act 2005 has enhanced the brand image of public sector enterprises in India and abroad.

Dr. Choubey emphasized on the level playing field between



Dr. U. D. Choubey, DG, SCOPE addressing the Conference of State Chief Information Commissioners in New Delhi. Also seen in the picture (on right) is Mr. Vijay Sharma, Chief Information Commissioner, CIC.

government/public sector and non-government sectors on the

principle of equity specially when the listed private companies or NGOs are holding public money through share holders and financial institutions. Dr. Choubey was of the opinion that public money in the private hands is equally bad.

Dr. Choubey said that there are large number of habitual seekers of irrelevant clarifications under RTI which is affecting the productivity of CPSEs. He further informed that SCOPE had obtained details of the habitual information seekers from the CPSEs and the same has been provided to the august institution of CIC.



4th Global Leadership Programme

SCOPE for Developing Global Leaders in PSEs

SCOPE organized a workshop on 4th Global Leadership Program for senior executives of public sector enterprises on 28th August 2015 at SCOPE Convention Centre, New Delhi. IIM-Calcutta was the resource organization. Mr. A. Luikham, IAS, Secretary, Department of Public Enterprises (DPE) delivered the Keynote Address. Mr. R.G. Rajan, Chairman, SCOPE, Dr. U.D. Choubey, Director General, SCOPE and Prof. Sougata Ray, Professor, IIM-C and Programme Director also addressed the Opening Session.

Dr. Madhukar Gupta, IAS, Additional Secretary, DPE, Mr. A.N. Tiwari, former Chief Information Commissioner, CIC and Mr. M.S. Sahoo, Member, Competition Commission of India addressed various sessions of the program. Mr. U.K. Dikshit, Adviser (Programs), SCOPE delivered the concluding remarks.



Mr. A. Luikham, IAS Secretary, DPE (center) addressing the program. Sitting on his left is Mr. R. G. Rajan, Chairman, SCOPE and on his right Dr. U. D. Choubey, DG, SCOPE.

While delivering the Keynote Address, Mr. A. Luikham, IAS, Secretary, DPE complimented SCOPE for organizing Global Leadership Programme for developing world class leaders in public sector enterprises. He said the government has faith in the PSEs and it is very keen to make PSEs more vibrant. He further said that opportunities are immense

and advised the PSE executives to sharpen their competitive edge through management development programs.

Mr. Luikham said in the present business scenario, there is a need to develop leaders who can steer their business organizations and at the same time, discover opportunities to expand and grow their business in the interest of

the stakeholders.

Mr. R.G. Rajan, Chairman, SCOPE in his address said public sector enterprises in the wake of globalization and competitive challenges, have moved into a new phase. They need to play a pro-active role to perform optimally in their areas of operation, attain organizational goals, embrace global business standards



(L to R) Mr. R. G. Rajan, Chairman, SCOPE, Dr. U. D. Choubey, DG, SCOPE, Dr. Madhukar Gupta, IAS, Additional Secretary, DPE, Mr. A.N. Tiwari, Former CIC and Mr. M.S. Sahoo, Member, CCI addressing the Global Leadership Program.

and improve their performance in a transparent and ethical way.

Mr. Rajan said a leader needs to be catalyst in inspiring people to accomplish their goals and nurture an environment in which openness can prevail. The public sector enterprises have immense responsibility and need to have a leader with global vision and outlook. Global leader is the one, who thinks beyond the walls of the company, sector, state, country. He also announced that SCOPE will shortly organize an exclusive workshop for women executives as a part of succession planning.

Dr. U.D. Choubey, Director General, SCOPE in his Welcome Address said Global Leadership Programme is one of the most

prestigious flagship programme of SCOPE for developing world class leaders in public sector enterprises.

Dr. Choubey said in India we have the best leaders in public enterprises. With liberalization and globalization, the PSEs have now realized the importance of innovation, organizational transformation and change mindset to promote a brand PSE. He said apart from possessing thorough knowledge, deep understanding of the realities and a clear vision of the future, the changing scenario of today has made it imperative to develop a leadership pipeline through a system oriented process. Succession planning, is, therefore, an integral part of this process. One of the biggest

challenges for today's leaders is to successfully manage diversity, he added.

During the day-long deliberations, three sessions were held. These were addressed by Dr. Madhukar Gupta, IAS, Additional Secretary, DPE (Topic: Role of DPE in Policy & Governance Framework), Mr. A.N. Tiwari, former Chief Information Commissioner, Central Information Commission (Topic: Key Issues in Implementation of the RTI Act), and Mr. M.S. Sahoo, Member, Competition Commission of India (Topic: Strategic Dimensions of the Competition Law). The programme was attended by senior executives of public enterprises.



Group photograph of the delegates of the Global Leadership Program with Secretary DPE, Chairman, SCOPE and DG, SCOPE.

Mr. Ajit Seth appointed Chairman, PESB Ms. Gauri Kumar and Mr. Ansuman Das, Members PESB

Mr. Ajit Kumar Seth, former Cabinet Secretary has been appointed Chairman of the Public Enterprises Selection Board (PESB). Ms. Gauri Kumar, IAS (Retd) and Mr. Ansuman Das have also been appointed as Members of PESB. Ms. Gauri Kumar is former Secretary (Coordination & Public Grievances), Cabinet Secretariat, and former Labour Secretary while Mr. Ansuman Das is former CMD, National Aluminum Company Ltd. PESB is a high powered body constituted by Government of India with the objective of evolving a sound managerial policy for the Central



Mr. Ajit Seth, IAS (Retd.)
Chairman, PESB



Ms. Gauri Kumar, IAS (Retd.)
Member, PESB



Mr. Ansuman Das
Member, PESB

Public Sector Enterprises and, in particular, to advise Government on appointments to their top management posts. Mr. Rajiv Rai is Secretary, PESB while Mr.

Ashish Kumar is Director, PESB. The other members are, Mr. K M Acharya and Mr. R Gopalan. Mr. Rajeshwar Lal is the Under Secretary & CPIO, PESB.

SCOPE for Further Refoms in PSEs

Dr. U.D. Choubey, Director General, SCOPE addressed the inaugural session of the Elets 2nd Annual PSU Summit & Awards 2015 on 26th August 2015 in New Delhi. Dr. Choubey also presented the Elets 2nd Annual PSU Summit Awards 2015 to PSEs. The PSU Summit and Award function was organized jointly by Elets and SCOPE on 26th August 2015 in New Delhi.

While speaking in the inaugural session of the Summit, Dr. U.D. Choubey, applauded the spectacular performance and contribution of PSEs to national economy.

Dr. Choubey said while a number of reform measures have been taken by the government, there is need for further reforms in PSEs in line with the reforms initiated the world over to strengthen the state



Dr. U. D. Choubey, DG, SCOPE addressing the 2nd Annual PSU Summit & Awards 2015 in New Delhi.

owned enterprises. Worldwide there is trend to create Sovereign Wealth Fund and Sovereign Holding Company to consolidate capital in hands of sovereign governments to strengthen

public sector enterprises and for better welfare State. He also emphasized the need for a well-documented Ownership Policy to strike a right balance between autonomy and State control.

Conference Facilities at SCOPE Convention Centre

The centrally air-conditioned SCOPE Convention Centre at SCOPE Complex, Lodhi Road, New Delhi provides excellent conference facilities to PSEs, Govt. Departments, Autonomous Bodies, Institutions/NGOs etc. The Auditorium and other Conference Halls are equipped with projector and screen facilities, sound & light control room with recording & P.A. facility, etc. Details of the capacity of the Auditorium and other Halls, which are available on nominal tariff are given below.

Auditorium



The Auditorium having capacity of 310 persons (300 Chairs + 10 Nos. Chairs at stage) capacity equipped with mikes on dias and podium on stage.

Mirza Ghalib Chamber



The chamber having capacity of 108 persons (102 Nos. Chairs + 6 Nos. Chairs on Dias) equipped with mikes on table, dias and podium.

Tagore Chamber



The chamber having capacity of 92 persons (86 Nos. Chairs + 6 Nos. Chairs on Dias) equipped with mikes on dias, tables & podium.

Bhabha Chamber



The chamber having capacity of 44 persons (24 Nos. Chairs on round table and 20 Nos. Chairs on sides) equipped with mikes on dias, tables & podium.

Fazal Chamber



The chamber having capacity of 25 persons (15 Nos. Chairs on round table and 10 Nos. Chairs on sides) capacity with board room type sitting arrangement equipped with mikes.

Business Centre



The Business Centre having capacity of 7 persons equipped with multi point Video Conferencing System (1+3), at three locations at a time for National & International both.

Banquet Hall



The banquet hall having capacity of 500 Persons for the purpose of lunch & dinner. Sitting arrangement could be done for 90 persons.

Annexe I



The Annexe-I having capacity of 25 Persons.

Annexe II



The Annexe-II having capacity of 25 Persons.

Tansen Chamber at UB



The Tansen Chamber having capacity of 50 persons having stage and podium.

Amir Khusro Chamber at UB



The Amir Khusro Chamber having capacity of 50 persons having facility of stage and podium.

For Booking & Tariff details please contact

Mr. M. L. Maurya, GM (Tech.)
Mobile: 9313375238

Mr. A. Zaman, Manager (HR)
Mobile: 9868502306

STANDING CONFERENCE OF PUBLIC ENTERPRISES

1st Floor, Core No. 8, SCOPE Complex, Lodhi Road, New Delhi - 110003 Phone: 011-24360101 & 24361747 • Fax: 011-24361371

Conference Facilities at SCOPE Minar Convention Centre

SCOPE Minar, an architecturally conceived in the form of two high rise curvilinear tower blocks sitting on a four storey circular Podium Block, is strategically located in Laxmi Nagar District Centre, Delhi -110092 and housing around 40 PSEs of repute. It is one of the known buildings of East Delhi. It has a very size Reception Foyer giving ambience look inside the building. There is a green environment all around the SCOPE Minar with large size planters all around. The building is also having state of art Convention Centre, comprising four halls i.e.

Convention Hall



A large sized Convention hall having sitting capacity of 300 delegates. Various seminars, training programmes, presentations, get to gather etc. are conducted in Convention Hall. It provides ambient and peaceful environment for the programmes.

VIP Lounge



VIP Lounge having sitting capacity of 60 delegates. The executives and higher level officers, Directors, CMDs can use it as waiting lounge also.

There is a wide space for vehicle parking that cater for a capacity of 700 cars, including the newly built good quality Banquet Hall wherein 300 delegates can comfortably dine at a time, makes it special to deliver an all-round conducive meeting environment.

Meeting Hall



Meeting hall having "U" shaped table, with a meeting capacity of 65 delegates. Most widely used for small size meetings and training programmes, group discussion, power point presentations etc.

Banquet Hall



A new beautiful Banquet Hall with latest specification of engineering has been created in SCOPE Minar. It has attached huge kitchen and washrooms facility. Around 300 persons can dine in the banquet hall including sitting of 50 persons.

For Booking & Tariff details please contact

Mr. M. L. Maurya, GM (Tech.) (M) 9313375238 **and Mr. Shubh Ratna**, DCE(C), SCOPE Minar
(M) 9873398242, (O) 011-22458176, 22458178, • Email: shubhratna@yahoo.co.in

SCOPE Invites PSUs to use Excellent Video Conferencing Facility at its Business Centre



The prestigious Business Centre at SCOPE Convention Centre in SCOPE Complex, New Delhi is equipped with High Definition picture quality Video Conferencing facility having both IP and ISDN line for one or multi-point National & International Conferences. In addition to this, a Multi-functional device (photocopier) with additional facility of printer, fax and scanner attached with Computer/Laptop with internet surfing has also been provided at the Business Centre to the companies holding conferences/meetings in the Auditorium & different Halls/Chambers in the SCOPE Convention Centre. The aesthetic decor with laminated walls, beautiful energy efficient LED lights, comfortable sitting for eight persons and sophisticated Sound System is enhancing the looks of Video Conferencing Chamber.

For Booking & Technical details please contact:

Mr. M. L. Maurya
GM (Tech.)
Mobile: 9313375218

Mr. A. Zaman
Manager (HR)
Mobile: 9668502306

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Celebration of 69th Independence Day

Independence Day Celebrations at RCF



Mr. R. G. Rajan, CMD, RCF, addressing the gathering on I-Day.

Mr. R. G. Rajan, CMD, Rashtriya Chemicals and Fertilizers Ltd. (RCF) unfurled Indian Tricolour on the occasion of 69th Independence Day celebrated in RCF Sports Complex in presence of all Directors Executive Directors, Senior Officials, RCF Employees and their families. Mr. Rajan addressed the gathering informing company's achievements, briefed about future plans and distributed various awards and prizes.

Independence Day celebrated at Western Coalfields Limited



Mr. R. R. Mihsra, CMD, WCL addressing the gathering on I-Day.

Independence Day was celebrated in WCL with full zeal. CMD, WCL, Mr. Rajiv R. Mishra unfurled the tricolor National Flag and took the guard of honour from WCL Guards. While addressing on Independence Day, Mr. Mishra said that our country is known worldwide for geographical diversity and rich cultural heritage.

Director(Technical/Operations) Mr. S. S. Malhi, Mr. G. Janardhan (IPS) Chief Vigilance Officer, Director (Personnel) Dr. Sanjay Kumar, Steering Committee and Welfare Board Members, S/Mr. S.Q. Zama, N.C. Nune, Umashankar Singh, R.K. Chib, A.P. Singh, Rakesh Chatturvedi, Ramkera Yadav, T.B. Raju and Mr. Saurabh Dubey were present on the dais.

Oil India Limited celebrates 69th Independence Day



Mr. U.P. Singh, Additional Secretary, MoPNG and CMD, Oil India Limited, delivering his Independence Day address.

Oil India Limited (OIL) celebrated the 69th Independence Day of the country, with full zeal and vigour, in its Corporate Office in Noida. Mr. U.P. Singh, Additional Secretary, MoPNG and CMD, Oil India Limited, unfurled the National Flag amidst the singing of the National Anthem by OIL's employees and their families, in the presence of the Functional Directors on the Board of OIL.



Roof top of 37 cities will no longer be just roof tops. Power Generating Stations

Solar Energy Corporation of India, a Govt of India Enterprises has changed about 200 roof top in the country to an independent Power Producer through Solar Energy.

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- Implementation of the scheme for setting up 750 MW of Solar PV projects with VGF under JNNSM Phase II Batch I
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Consultancy services:

SECI provides complete Project Management Solution for large scale Solar Power Projects and rooftop on turnkey basis across the countries with special focus on Public Sector Entities.

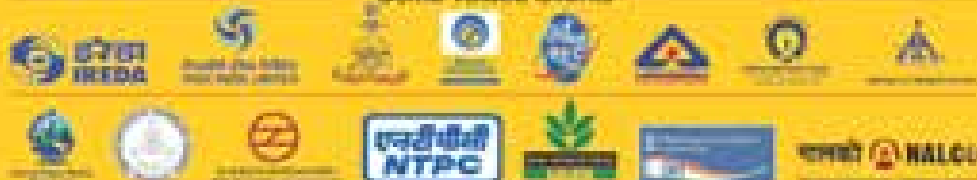
- Solar Feasibility studies
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Solar Energy Corporation of India

1st Floor, D-3, A Wing, Vigyan Building District Centre, Saket, New Delhi - 110017
Ph: 911-7199200, Email: corporate@seci.gov.in, Website: www.seci.gov.in

Some valued Clients



Independence Day celebrations at SAIL

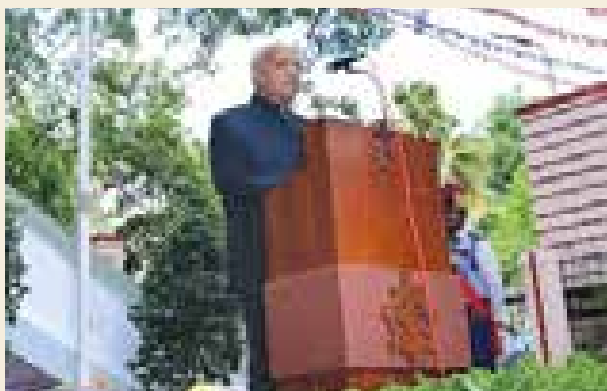


Flag hoisting at SAIL, Headquarters

Mr. Sanjay Kumar, Section Officer, SAIL hoisted the National Flag at SAIL Headquarters to mark the Independence Day celebrations at SAIL. Mr. Sanjay, an epitome of dedication and excellence, despite being differently abled performs to the best traditions of professional excellence and commitment. SAIL's top management, senior union leaders and large number of SAIL employees and their families were present on the occasion.

Timely project completion essential to retain market leadership: CMD, NMDC

Mr. Narendra Kothari, Chairman and Managing Director, NMDC Ltd. drew on the rich legacy of NMDC's contribution to the nation over the years and exhorted employees to take NMDC to



Mr. Narendra Kothari, CMD, NMDC addressing the employees on I-Day

greater heights by their dedicated and focused efforts, as he unfurled the tricolour in the presence of all Directors, senior officials, employees and their family members, at NMDC headquarter on the occasion of Independence Day.

Pilot Plants For Developing Value Added Products from Lignite – CMD, NLC

Feasibility studies for two Pilot Plants for developing value added products from Lignite Viz. Upgradation of Brown Coal Process to enhance the calorific value for use in Super Critical boilers for Power Generation and to find the sustainability of lignite to use as a substitute for Metallurgical



Mr. M. A. Basheer, Service Worker, New Service Unit and his spouse Ms. B. Khatija being Honoured by Mr. B. Surender Mohan, CMD, NLC

Coke have been taken up by NLC was announced by Mr. B. Surender Mohan, CMD, NLC during his address at the Independence Day Celebration 2015. The daylong celebrations commenced with the garlanding of Mahatma Gandhi bust at Township Administration Office premises by Mr. B. Surender Mohan. Later, he hoisted the National flag at Bharati Stadium and inspected the ceremonial parade and accepted the guard of honour presented by Central Industrial Security Forces, NLC Security Personnel, Home Guards, Scout and Guides, NSS Volunteers and Schools & College Students.

Independence Day celebrated at CCL with full enthusiasm

Mr. Gopal Singh, CMD, CCL and Chief Guest of the function, inspected the parade of CCL



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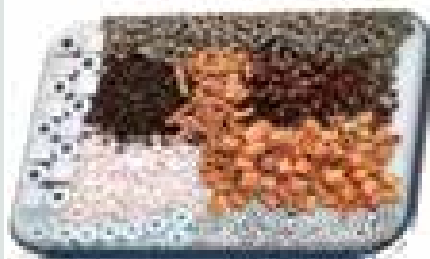


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Mr. Gopal Singh, CMD, Central Coalfields Limited (CCL) hoisted the tricolor at Mahatma Gandhi Krindangan, Gandhinagar, Ranchi to mark 69th Independence Day.

security personnel, CISF, Army Band, students of Gandhinagar D.A.V. School & Gyanodaya School. Mr. D. K. Ghosh, Director (Finance), Mr. R.S. Mahapatro, Director (Personnel), Mr. Subir Chandra Director Technical (P&P), Mr. Arbind Prasad, CVO, Mrs Pramila Singh, W/o CMD, Mrs. Rimi Ghosh W/o Director (Finance), Mrs. Sunita Mahapatra W/o Director (Personnel), Mrs. Sujata Prasad wife of CVO, Chief General Managers, General Managers, HODs of different departments along with their families were present. General public, retired employees, and representatives of trade unions, were also present on the occasion.

e-Surveillance initiative marks I-day celebrations in MCL

Inauguration of electronic surveillance system for



Mr. A. N. Sahay, CMD, MCL hosting the National Flag

monitoring operations marked the celebrations of 69th Independence Day at Mahanadi Coalfields Limited (MCL) in Odisha. The surveillance system, which would also do the real time monitoring of mining and dispatch activities in the coalfield areas, was inaugurated by MCL's CMD, Mr. A. N. Sahay after the colourful celebrations of Independence Day at company headquarters here. Mr. Sahay was also briefed about the operations of e-Surveillance System by Chief Vigilance Officer Mr. Deepak Srivastava, IFS. With this new e-initiative, now all the operations and the data generating in the mining areas of MCL will be directly under surveillance at the company headquarters here.

Mr. A. K. Tiwari, Director (Technical/Operations), Mr. J. P. Singh, Director (Technical/Projects & Planning) and Mr. K. K. Parida, Director (Finance) were prominent among senior officers of MCL present on the occasion.

Flag Hoisting ceremony at GRSE



Rear Admiral A. K. Verma, VSM, IN (Retd), CMD, GRSE during I-Day Celebration

Rear Admiral A. K. Verma, VSM, IN (Retd), CMD Garden Reach Shipbuilders & Engineers Ltd., hoisted the National Flag on the occasion of 69th Independence Day Celebrations. In his speech after inspecting the parade at GRSE, the CMD complimented all personnel of company on the commissioning of Offshore Patrol Vessel CGS Barracuda built by GRSE, by the Prime Minister of India at Port Louis, Mauritius in March 2015. With this feat

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GRSE attained the distinction of achieving the first ever export of a warship by the country. He emphasized the need to continue the good work and meet the production targets set before the Company.

HEC celebrates Independence Day



HEC: Independence Day celebrations at HEC, Ranchi

Cochin Shipyard celebrates Independence Day

The Independence Day celebration was conducted at Cochin Shipyard Limited (CSL) today at 0800 hrs. Cmde K Subramaniam, CMD, (CSL) unfurled the tricolor and inspected the CISF contingent and METI trainees. Directors and senior officials of CSL were also present. Apart from the traditional flag hoisting and salute, the Company used the occasion to commend the outstanding performers of Cochin Shipyard family. In all, 29 employees who had displayed outstanding commitment and enterprise in their field of activity was awarded with Commendation Certificate and cash awards.



Cmde K. Subramaniam, CMD, CSL unfurling the National Flag

69th I-Day celebrations at Dredging Corporation

69th Independence Day was celebrated at Dredging Corporation of India Ltd (DCIL) corporate office with great enthusiasm. Mr. Rajesh Tripathi, CMD, Dredging Corporation of India Ltd unfurled the National Flag and conveyed the Independence



Mr. Rajesh Tripathi, CMD, DCIL during I-Day Celebration

Day greetings to all the officers, employees and their families. On the memorable day, CMD expressed gratitude to all the freedom fighters who have participated in the freedom struggle movement and achieved Independence. Mr. M. S. Rao, Director (Ops.&Tech.), Mr. Sreenivas, CVO, Mrs. Anupama Tripathi, wife of CMD and other Head of Departments, employees and their families were present on this occasion

CPT celebrates Independence Day



Mr. Paul Antony, Chairman, Cochin Port Trust inspecting the parade by CISF.



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Corporate Social Responsibility

RCF Organizes Free Medical Camp



Mr. R. G. Rajan, CMD, RCF addressing the gathering at the Medical Camp

Mr. R. G. Rajan, CMD, Rashtriya Chemicals and Fertilizers Ltd., inaugurated free Medical and Eye check-up camp organised in collaboration with World Confederation of Warriors, NGO at Shree Narayan Guru High School, Chembur for School students. More than 600 students were given free medical and eye check up. Out of this 120 boys and girls were found to have poor eyesight and were given free spectacles.

Assistance from RCF Jyoti Ladies Club

Ms. Kowsalya Rajan, President, Ms. Anita Ghasghase, Vice-President and Ms. Neeraja Agrawal, Secretary of RCF Jyoti Ladies Club donated sewing-piko machine to a needy woman of Vanavasi Kalyan Ashram, Chinchvad in presence of Ms. Snehal More, Ms. Savita Gupta and other JLC members.

MMTC Constructs Toilet Complexes in Haiderpur

In support of the Prime Minister's Swachh Bharat Mission, MMTC has constructed two (12-seater) toilet complexes at JJ Cluster, Haiderpur in Shalimar Bagh area, New Delhi as a CSR initiative to improve sanitation and hygiene facilities. Haiderpur, a slum area in North Delhi, is a cluster of more than



Mr. Ved Prakash, CMD, MMTC inaugurating the complex

3500 jhuggi/jhophris. Due to lack of proper sanitation facilities, open defecation was the only option available to its residents. MMTC partnered with Sulabh International (Social Service Organization) to construct these toilet complexes, which were inaugurated by Mr. Ved Prakash, CMD, MMTC. He was accompanied by MMTC's Director (Personnel) Mr. Rajeev Jaideva and Director (Marketing) Mr. P. K. Jain.

AAI Women Welfare Association redevelops children's park



Mr. R.K.Srivastava, IAS, Chairman, Airports Authority of India, and Ms Jugnu Srivastava, All India President, AAI Women Welfare Association "Kalyanmayee" amongst the children immediately after unveiling the new swings and benches in the garden at INA Colony, New Delhi.



एक नये स्वच्छता की ओर

Ensuring ecological balance at NLC

One fact more than we take, that's our guiding tenet at NLC. Our key-tenet, natural lights, being a gift from Mother Nature, we ensure that we take every effort to protect the environment around us.

NLC is adopting the best Environment management practices and eco conservation measures since inception. Towards conservation of ecosystem, forest land is reclaimed and restored to original status and converted into agricultural lands, orchards, afforestation and ponds. The slopes that are developed using the dumping of overburden is stabilised with thick green belt development which has various positive impact on the environment.

NLC has developed a thick green cover in its Industrial Units as well as in the Township area. Lots of trees have been planted in and around the Mine and Thermal Units to maintain ecological balance. Usage of plastic carry bags has been banned in NLC's Township area and NLC is also operating a plastic recycle plant which waste plastic is converted into oil for usage in road formation. Sustainable Development Projects are undertaken in the area of climate change, eco conservation, water conservation, energy conservation, green energy and sustainability training. Sustainability development training are imparted to women employees.

Towards its commitment to reduce the Carbon footprint, NLC is implementing renewable energy Projects viz., 11 MW Wind Power Project at Nathamkulam, Tamil Nadu and 10MW Solar Energy Project at Neyveli.

It is our dream to make and sustain an environment that is green, clear and serene. It will remain a constant quest and greatest goal, as we embark on our journey towards a new tomorrow.



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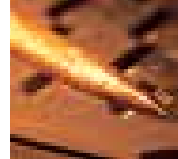
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Airports Authority of India Women Welfare Association redeveloped children park at INA for the benefit of society at large by providing items like benches, swings, garden GYM etc; which was unveiled by Mr. R.K.Srivastava, IAS, Chairman, AAI, in the presence of Ms. Jugnu Srivastava, All India President, Mr. G.K. Chaukiyal Member (Operations), Mr. Anuj Aggarwal, Member (HR), Ms. Vijay Chaukiyal and Dr. Chhavi Aggarwal, Vice President, Kalyanmayee.

NTPC Achieves the Swachh Vidyalaya Commitment

In response to the clarion call given by Prime Minister in his Independence Day speech last year, NTPC Limited, had committed to construct 24626 toilets in and around 16000 schools spread 17 states and 80 districts across the country. NTPC has achieved the completion target of 24626 toilets under Swachh Vidyalaya Abhiyan. NTPC has taken this initiative for promoting and realizing the dream of a clean India.

Odisha Chief Minister Mr. Naveen Patnaik lays foundation of Mahanadi Institute of Medical Sciences & Research, Talcher

Mr Naveen Patnaik, Chief Minister of Odisha, laid the foundation stone of Mahanadi Institute of Medical Sciences and Research, a Rs 492 crore CSR project of Mahanadi Coalfields Limited (MCL), in Talcher Coalfields of Odisha.

The foundation stone of ambitious CSR project in the country's largest coalfield by a coal CPSU was laid in the august presence of Mr. Piyush Goyal, Minister of State (Independent Charge) for Coal, Power and New & Renewable Energy and Mr. Dharmendra Pradhan, Minister of State (Independent Charge)

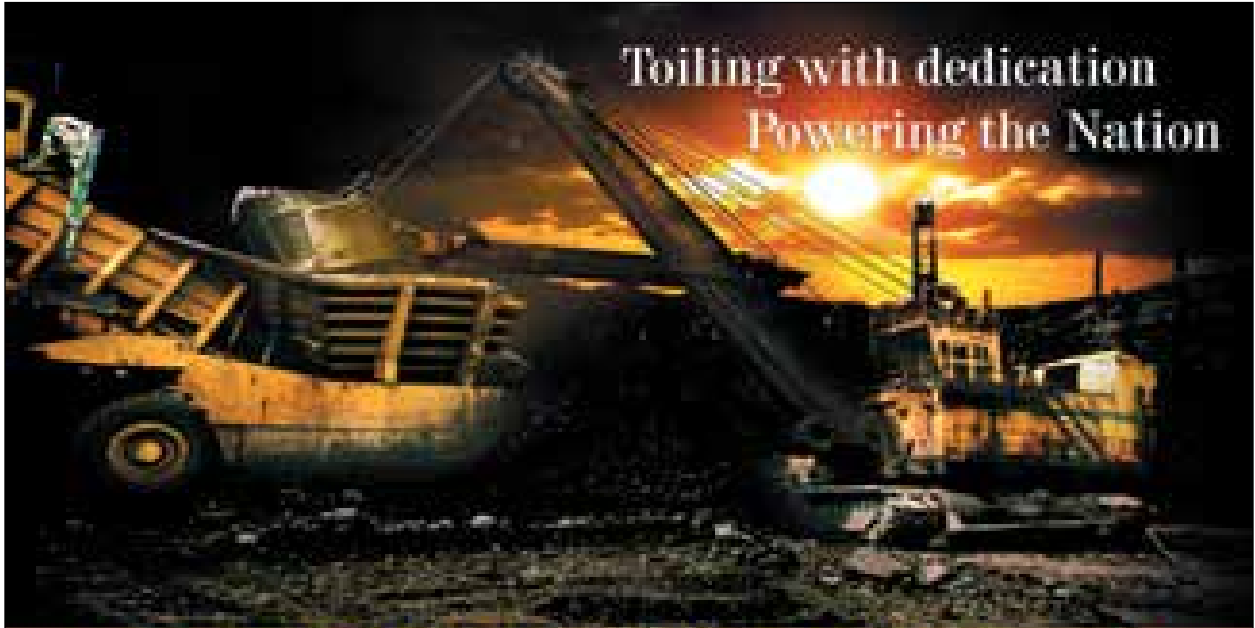
for Petroleum & Natural Gas.

Mr. Atanu Sabyasachi Nayak, Health and Family Welfare Minister, Government of Odisha, Mr Tathagata Satpathy, MP, Dhenkanal constituency and Mr. Braja Kishore Pradhan, MLA, Talcher constituency were among the distinguished people present at the ceremony, which was witnessed by a large gathering of people of peripheral areas of MCL.

MCL CMD Mr. A.N. Sahay, Director (Technical/Operations) Mr. A K Tiwari, Chief Vigilance Officer Mr. Deepak Srivastava, IFS, Director (Technical/Projects & Planning) Mr. J P Singh, Director (Personnel) Mr. P C Panigrahi and Director (Finance) were also present.

The MIMSR will have a 100-seat medical college with 500 bedded multi-specialty Hospital with the state-of-the-art medical facilities in Anatomy, Bio-chemistry, Micro-Biology, Physiology, FM, toxicology, Pharmacology, Pathology, Community Medicine, Laboratory and Library. The project envisages a hostel for 300 boys, a separate hostel for 200 girl students, two blocks of Hostel for 100 interns, a hostel for 57 junior resident doctors and a 50-bedded nurses' hostel. ■■■





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Awards & Accolades to PSEs

RCF Bags Best PSU Award



Mr. R.G. Rajan, CMD, RCF, receiving D&B India's Top PSU Award, 2015

Mr. R. G. Rajan, CMD, Rashtriya Chemicals and Fertilizers Ltd. received the 'Dun & Bradstreet India's Top PSUs Awards 2015' in the Fertilizers sector at the hands of Mr. R. M. Malla, former CMD, IDBI, Former CMD, SIDBI and Current Chairman, of SME Ratings Ltd. The Chief Guest of D&B award ceremony Mr. Anant G Geete, Minister of Heavy Industries and Public Enterprises, felicitated all winners with the best wishes for best future.

RCF bags 1st Prize for Rajbhasha Performance (TOLIC)



Mr. R. G. Rajan, CMD, RCF receiving the award from Smt. Nishi Vasudeva, CMD, HPCL.

Mr. R. G. Rajan, CMD, Rashtriya Chemicals and Fertilizers Limited (RCF) received the 1st prize for best performance in Rajbhasha (TOLIC) 2014-15 at the hands of Smt. Nishi Vasudeva, CMD, Hindustan Petroleum. Mr. P. G. Deshpande, ED(HR) and Senior Officials of RCF were also present in the function organized during the TOLIC Meeting.

FACT awarded "The Outstanding Achievement of the Year- Inland Water Transport"



Mr. M. Sreekum, GM (Production Control) and Mr. Jacob Kurien (GM- Cochin Division), FACT receiving the Award from Mr. Amitabh Verma, I.A.S., Chairman, IWA

FACT was awarded "The Outstanding Achievement of the Year- Inland Water Transport" and the "Cargo Owner of the Year- Inland Water Transport" for the efforts taken to create a strong regional/national attention and giving impetus to the cause of Inland Water Transport during 2014-15. The Awards were presented to FACT by Mr. Amitabh Verma, I.A.S, Chairman, Inland Waterways Authority of India, and Mr. Paul Antony, I.A.S, Chairman, Cochin Port Trust, and Chairman of Indian Ports Association, respectively, Mr. M. Sreekumar, GM (Production Control) and and Mr. Jacob Kurian,(GM-Cochin Division) received the awards representing the Company management.



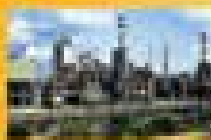
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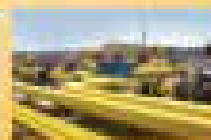
Refineries



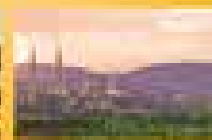
Petrochemicals



Offshore



Pipelines



Marketing

NBCC Receives International Awards



World Business Leader Award

NBCC was recently honoured with 'The BIZZ Awards 2015' by the World Confederation of Businesses. The Awards included World Business Leader Award conferred upon NBCC and World Leader Businessperson Award bestowed on Dr. Anoop Kumar Mittal, CMD, NBCC. The Award function was held in Houston, Texas (US).

NBCC CMD Awarded: Real Estate Most Enterprising CMD of The Year Award

Dr. Anoop Kumar Mittal, CMD, NBCC, has been awarded "Real Estate Most Enterprising CMD of the Year" by 24 MRC Network at 2015 Leaders Awards Ceremony, held recently in New Delhi. Mr. Rajendra Chaudhari, Director (Commercial), NBCC, received the Award at the function on behalf of CMD, NBCC. The Award has been presented to Dr. Mittal for his outstanding contribution to the Business Sector.



Mr. Rajendra Chaudhari, Director (Commercial), NBCC, receiving the Award on behalf CMD, NBCC

ONGC Bags Awards in Multiple Categories at Oil Industry Safety Awards 2013-14



Safety awards being received by ONGCians.

ONGC received three awards at Oil Industry Safety Awards 2013-14, which were presented by the Minister of State (I/C) for Petroleum & Natural Gas, Mr Dharmendra Pradhan at New Delhi. ONGC's Rajahmundry Asset bagged the 'Oil Industry Safety award 2013-14' for Best in Oil & Gas Assets (Onshore) category, while ONGC's B193 received for Best in Oil & Gas Assets (Offshore) category and Uran Plant received the safety award in 'Gas processing Plants' category.

EIL conferred with Dun & Bradstreet India's Top PSUs Award 2015 in "Consultancy Services: Engineering & Tech"



Mr. Ajay N. Deshpande, Director (Technical), EIL, receiving the award

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Engineers India Ltd. (EIL) has been conferred with Dun & Bradstreet India's PSUs Award 2015 in the category of "Consultancy Services: Engineering & Tech". Mr. Ajay N Deshpande, Director (Technical), EIL received the award on the Company's behalf during an award function held on in New Delhi recently.

Director (Finance), EIL conferred with Citation on "100 Most Influential CFO's of India"



Mr. Ram Singh, Director (Finance), Engineers India Ltd. (EIL) has been conferred with the Citation on "100 Most Influential CFOs of India" by Chartered Institute of Management Accountants (CIMA) in a award ceremony held in Mumbai recently.

Director (HR), EIL conferred fellowship by All India Management Association



Ms. Veena Swarup, Director (HR), EIL, receiving the fellowship

Ms. Veena Swarup, Director (HR), Engineers India Ltd.(EIL) was conferred fellowship by All India Management Association (AIMA) at their twentieth convocation, held in India Habitat Centre, New Delhi recently. The ceremony took place in

the presence of General (Retd.) V. P. Malik, PVSM, AVSM, Former Chief of Army Staff; Ms. Rekha Sethi, Director General AIMA; Mr. Rajan Saxena, Chairman Board of Studies AIMA CME; Mr. Raj Agarwal, Director AIMA CME; senior EIL officials, faculty and scholars from AIMA.

BEL wins Dun & Bradstreet Award



Mr. S. K. Sharma, CMD, BEL, receiving the Dun & Bradstreet Top PSU Award 2015 for BEL from Mr R M Malla, Chairman, Smera Ratings Limited.

Bharat Electronics Ltd (BEL) has been chosen as the top Indian company in the Electrical & Electronic Equipment sector in the Dun & Bradstreet 'India's Top PSUs Awards 2015'. Mr S K Sharma, CMD, BEL, received the award for BEL along with Mrs Anandi Ramalingam, GM (National Marketing), BEL, from Mr R M Malla, Chairman, Smera Ratings Limited, at the awards ceremony held in New Delhi recently.

Director (HR) of BEL conferred Distinguished Fellow of Institute of Directors



Mr. M. L. Shanmukh, Director (HR), BEL, receiving the 'Distinguished Fellowship' of the IOD for the year 2015-16 from Justice M. N. Venkatachaliah, former Chief Justice of India. Dr. K Radhakrishnan, former ISRO Chairman, is also seen among others.

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Mr. M. L. Shanmukh, Director (Human Resources) of Bharat Electronics Ltd (BEL), has been conferred the 'Distinguished Fellowship' of the Institute of Directors (IOD) for the year 2015-16. Mr. Shanmukh received the Certificate of Distinguished Fellowship from Justice M. N. Venkatachaliah, former Chief Justice of India, at the Silver Jubilee function of the Institute of Directors held at Bengaluru recently. Dr. K. Radhakrishnan, former ISRO Chairman, was present.



NSIC felicitated by Dun & Bradstreet, India



Mr. Ravindra Nath, CMD, NSIC in discussion with Mr. Anant Geete, Minister of Public Enterprises and Heavy Industry,

M/s. Dun & Bradstreet felicitated NSIC on the occasion of, India's Top PSUs and Awards 2015, for completing 60 years in the service of MSMEs.

Oil India Limited wins the Oil Industry Safety Award for the year 2013-14

Oil India Limited (OIL) was conferred the Oil Industry Safety Award for "Best Near Miss Incidents Reporting, Production Operation- Onshore/Offshore" for the year 2013-14, in the awards ceremony held at the SCOPE Convention Centre, New Delhi recently. Mr. Dharmendra Pradhan, Minister of State (I/C) for Petroleum & Natural Gas, presented the award to Mr. U.P. Singh, IAS, Additional Secretary, MoPNG and CMD, OIL and Mr. P.K. Sharma, Director (Operations), OIL; in the presence

Mr. U.P. Singh, IAS, Additional Secretary, MoPNG and CMD, OIL, receiving the Oil Industry Safety Award for "Best Near Miss Incidents Reporting, Production Operation- Onshore/Offshore" for the year 2013-14, from Mr. Dharmendra Pradhan, Minister of State (I/C) for Petroleum & Natural Gas, along with Mr. P.K. Sharma, Director (Operations), OIL, in the presence of Mr. K.D. Tripathi, Secretary, MoPNG.

of Mr. K.D. Tripathi, Secretary, MoPNG, among other dignitaries. The award was conferred to Oil India Limited for the excellent performance of its Duliajan - Production Operation, in the "Best Near Miss Incidents Reporting, Production Operation- Onshore/Offshore" category.

NTPC awarded Corporate Governance Excellence Award



Mr. K. Biswal, Director (Finance), NTPC receiving the award from Mr. Piyush Goyal, Minister for Power, Coal & Renewable Energy

NTPC Limited has been awarded with "Corporate Governance Excellence Award in "Listed PSU

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Category -2014" in recognition for the outstanding Corporate Governance practice undertaken by the company. The award was presented by Mr. Piyush Goyal, Minister for Power, Coal & Renewable Energy at a function held in New Delhi recently. Mr. K.Biswal, Director (Finance), NTPC received the award on behalf of NTPC.

NTPC Awarded at the India's Top PSUs and Awards 2015 by Dun and Bradstreet



Mr. K. K. Sharma, Director (Operations), NTPC receiving the Award

NTPC has been awarded at the India's Top PSUs and Awards 2015 by Dun and Bradstreet in the Power Generation Category. The award was received by Mr. K.K. Sharma, Director(Operations), NTPC .

PFC conferred with Top PSU Award 2015



Mr. R. Nagarajan, Director (Finance) & Mr. D. Ravi, Ex. Dir., PFC jointly receiving the Award

Power Finance Corporation (PFC) received "India's Top PSU Award 2015" in the category of Financial Institution, NBFC and Financial Services. Mr. R. Nagarajan, Director (Finance) and Mr. D. Ravi, Executive Director, PFC jointly received this award from Mr. Rajender Mohan Malla, former Chairman & Managing Director, IDBI Bank Ltd. in a function organized by Dun & Bradstreet in New Delhi recently.

SAIL receives 'National Awards for Excellence in Cost Management – 2014'



Mr. Anil Chaudhary, Director (Finance), SAIL receiving the Award from Col. Rajyavardhan Singh Rathore, MoS, I&B

In recognition of the cost management efforts made, Steel Authority of India Ltd. (SAIL) has been conferred with the First Award under the category of Public Manufacturing: Organization (Large) in the 12th National Award for Excellence in Cost Management – 2014 given by the Institute of Cost Accountants of India. Union Minister of State for Information & Broadcasting, Col. Rajyavardhan Singh Rathore (Retd. AVSM) presented the award to Director (Finance), SAIL, Mr. Anil Chaudhary, who on behalf of the company accepted the honor in New Delhi recently. An eminent jury headed by Justice VN Khare, former Chief Justice of India selected the winners.

MCL bags Greentech Gold Award 2015

Mahanadi Coalfields Limited, was conferred with Greentech Gold Award-2015 for the outstanding

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Capacity at a glance

• Installed	: 1135 MW
• Ongoing	: 922 MW
• Future	
• Hydro	: 2564 MW
• Thermal	: 500 MW
• Solar	: 7 MW
Total	: 5128 MW



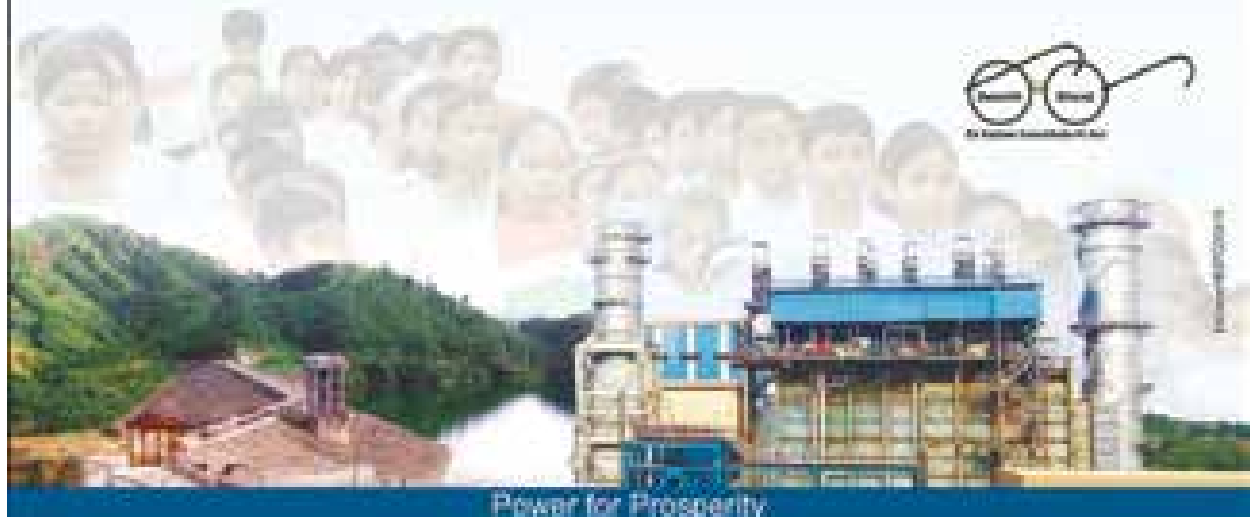
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North Eastern Electric Power Corporation Limited

A Government of India Enterprise

Brookland Compound, Lower New Colony, Shillong - 793003, Meghalaya

website: www.neepco.gov.in



Power for Prosperity



Mr. A.K.Tiwari, Director (Technical/Operation), Mr. S. Roy Choudhury, General Manager and Mr. Rajeev Kumar, Sr. Manager(Mining and Safety& Rescue), MCL receiving the Award

contribution in the field of safety, especially for achieving "0" fatal accident in the year 2014 for the first time in our company. The awards were received by Mr. A.K.Tiwari, Director (Technical/Operation), Mr. S. Roy Choudhury, General Manager and Mr. Rajeev Kumar, Sr. Manager (Mining and Safety & Rescue) at 14th Annual Greentech Safety Award-2015 presented by Greentech Foundation in New Delhi recently.

MMTC Wins EEPC Top Exporters' Gold Trophy



Mr. Ved Prakash, CMD, MMTC, receiving the Certificate of Excellence and the trophy from Smt. Nirmala Sitaraman, MoS, Commerce & Industry

MMTC has been awarded the Top Exporter's Gold Trophy (Merchant Enterprise) for year 2013-14 by the Engineering Export Promotion Council (EEPC) of India at the 46th National EEPC Awards for Export Excellence. Mr. Ved Prakash, CMD, MMTC, received the Certificate of Excellence and the trophy from Smt. Nirmala Sitaraman, Minister of State for Commerce & Industry in New Delhi recently. Mr. Prakash was accompanied by Mr. P.K. Jain, Director (Marketing), MMTC.

MRPL Awarded the "Top Exporter Premier Trading House – Non- MSME category"



Mr. Subrata Bandyopadhyay receiving the award from Mr. Sudhir Mungantiwar, Minister of Finance, Planning & Forest, Government of Maharashtra

MRPL bagged the "Top Exporter Premier Trading House Award – Non-MSME category" at the Export Excellence Awards by Western Region of Federation of Indian Export Organisations (FIEO), recently. On behalf of MRPL, GGM (F) Mr. Subrata Bandyopadhyay received the award from Mr. Sudhir Mungantiwar, Minister of Finance, Planning & Forest, Government of Maharashtra at an Award ceremony held in Mumbai.

BHEL Conferred EEPC Award



Mr. B.Prasada Rao, CMD, BHEL and Mr. Atul Sobti, Director (Power), BHEL receiving the Award from Smt. Nirmala Sitaraman, MoS, Commerce & Industry

For outstanding export performance, Bharat Heavy Electricals Limited (BHEL) has won the Engineering Export Promotion Council (EEPC)'s Top Export Award for the twenty fifth year in succession. It was conferred on BHEL in the category 'Star Performer in 2013-14 for Project Exports - Large Enterprise'. The award was presented by the Union Minister of State for Commerce and Industry (Independent Charge), Smt. Nirmala Sitharaman, was jointly received by Mr. B.Prasada Rao, CMD, BHEL and Mr. Atul Sobti, Director (Power), BHEL. ■■■



आने वाली पीढ़ी के लिये बिजली **बचाएँ**
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PSEs Signs MoUs

NBCC Signs MoU with Korea Land & Housing Corporation (LH)

In the presence of Dr. Anoop Kumar Mittal, CMD, NBCC, Mr. Rajendra Chaudhari, Director (Commercial), NBCC and Prof. Lee Ki-Yeal, Director, Korea Land & Housing Corporation, signed an MoU recently. Directors and senior officers of NBCC and Korean Delegation were also present on the occasion. The Strategic Cooperation through this MoU, is entered for sharing expertise & Joint exploration of Smart City Projects in India & Republic of Korea.



Dr. Anoop Kumar Mittal, CMD, NBCC, Mr. Rajendra Chaudhari, Director (Commercial), NBCC and Prof. Lee Ki-Yeal, Director, Korea Land & Housing Corporation with the MoU

NBCC to redevelop Delhi IIPA Campus

NBCC signed an MoU with Indian Institute of Public Administration (IIPA), for redevelopment of IIPA Campus, Delhi. Dr. Anoop Kumar Mittal, CMD, NBCC and Dr. Tishyarakshit Chatterjee, IAS (Retd.), Director, IIPA, were present on the occasion. The cost of the project is Rs.435 cr. NBCC has already executed Redevelopment Work of New Moti Bagh GPRC Complex, New Delhi and another one namely Rs.5000 cr. East Kidwai Nagar Redevelopment, New Delhi, is also going on at present.



Dr. Anoop Kumar Mittal, CMD, NBCC and Dr. Tishyarakshit Chatterjee, IAS (Retd.), Director, Indian Institute of Public Administration (IIPA), exchanging MoU documents

NBCC Signs MoU With DDA

Dr. Anoop Kumar Mittal, CMD, NBCC & Mr. Balvinder Kumar, Vice Chairman, DDA, recently signed an MoU, for integrated development of Lake View Complex, Trilokpuri, New Delhi by NBCC. NBCC had earlier signed another MoU with DDA for development of huge East Delhi Hub, Karkardooma, New Delhi on TOD norms.

NBCC Inks MoU with NIT

In the presence of Dr. Anoop Kumar Mittal, CMD, NBCC, Prof. Ajay K. Sharma, Director, National Institute of Technology (NIT), Delhi and Mr. N.P. Aggarwal, Executive Director, NBCC, the MoU for Development of Permanent Campus of National Institute of Technology at Narela, Delhi was signed on August 12, 2015. The Directors of NBCC and other senior officials of NIT and NBCC were also present on the occasion. NBCC has been executing number of projects for various NITs and IITs all across the country.

जब आप उत्कृष्टता में विश्वास करते हैं तो यह आपके जीवन का अलग अंग बन जाता है। यह एक अनुभव है जो आपको जो व्यक्तिगत और व्यावसायिक जीवन के अनेक क्षेत्र में उत्कृष्टता प्राप्त करने की राह दिखाता है। उत्कृष्टता प्राप्त करने के लिए आपको जो उत्कृष्टता प्राप्त करनी पड़ेगी वह व्यक्तिगत और व्यावसायिक जीवन के अनेक क्षेत्र में उत्कृष्टता प्राप्त करने की राह दिखाता है। उत्कृष्टता प्राप्त करने के लिए आपको जो उत्कृष्टता प्राप्त करनी पड़ेगी वह व्यक्तिगत और व्यावसायिक जीवन के अनेक क्षेत्र में उत्कृष्टता प्राप्त करने की राह दिखाता है।

When one believes in excellence, it becomes part of everyday life. It is this driving force that powers CONCOR to excel in every sphere of logistics operations. Our foundations lie in our long partnership with the rail network of India, leveraging its reach and reliability to drive value-for-money multi-modal logistics solutions. In addition to providing inland logistics by rail door-to-door last mile delivery, we also cover the management of Ports, air cargo complexes and a cold-chain. Through it all we continue to be customer focused performance driven and result oriented. Creating greater productivity and profitability through a process of constant innovation.

उत्कृष्टता

परिणामों की सीरीज कहीं अधिक है।

यह आप द्वारा प्रतिदिन किया गया कार्य है।



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HAL Holds Airline Operator Conference at Nashik; Maharashtra Govt Signs MoU with HAL



Dr. P. S. Meena, Additional Chief Secretary (Civil Aviation), Maharashtra and Mr. T. Suvarna Raju, CMD, HAL (left) signing an MoU at the Airlines Operators' Conference at HAL Nashik Airport.

HAL and Government of Maharashtra signed a MoU that allows HAL to use the Airport Terminal Building at Ojhar, near Nashik for 30 years on lease. The land belongs to HAL. Dr. P.S. Meena, Additional Chief Secretary (Civil Aviation), Maharashtra and Mr. T. Suvarna Raju, CMD, HAL signed the agreement in presence of Mr. Harishchandra Chavan, MP, Mr. Hemant Godse, MP, Mr. Anil Kadam, MLA (Niphad) and others.

MECON signs MoU with CPG Corporation, Singapore



MECON & CPG Corporation exchanging MoU in presence of Mr. A. K. Tyagi, CMD, MECON & Mr. Khew Sin Khoon, CEO CPG Corporation Singapore.

MECON Limited signed a Memorandum of Understanding (MoU) with CPG Corporation, Singapore recently. The MoU was signed by Mr Deepak Dutta, Director (Commercial) MECON and Mr Tan Shao Yen, MD, CPG Consultants, in the presence of Mr A K Tyagi, CMD, MECON and Mr Khew Sin Khoon, CEO, CPG Corporation in the presence of Mr S Chattopadhyay, Director(Project), Mr S R Sengupta, Director(Technology) and Mr A P Singh, Director(Engineering) and Mr Raimi Bin A Rahim, MD, CPG Consultants(India).

MoU between NCCBM & NTPC



Mr. R. K. Srivastava, ED (NETRA) NTPC Ltd. and Mr. V. V. Arora, Joint Director & Head NCCBM in presence of Mr. A. K. Jha, Director (Tech.) NTPC Ltd. and Mr. A Pahuja, Director General, NCCBM and senior officials with signed MoU Document

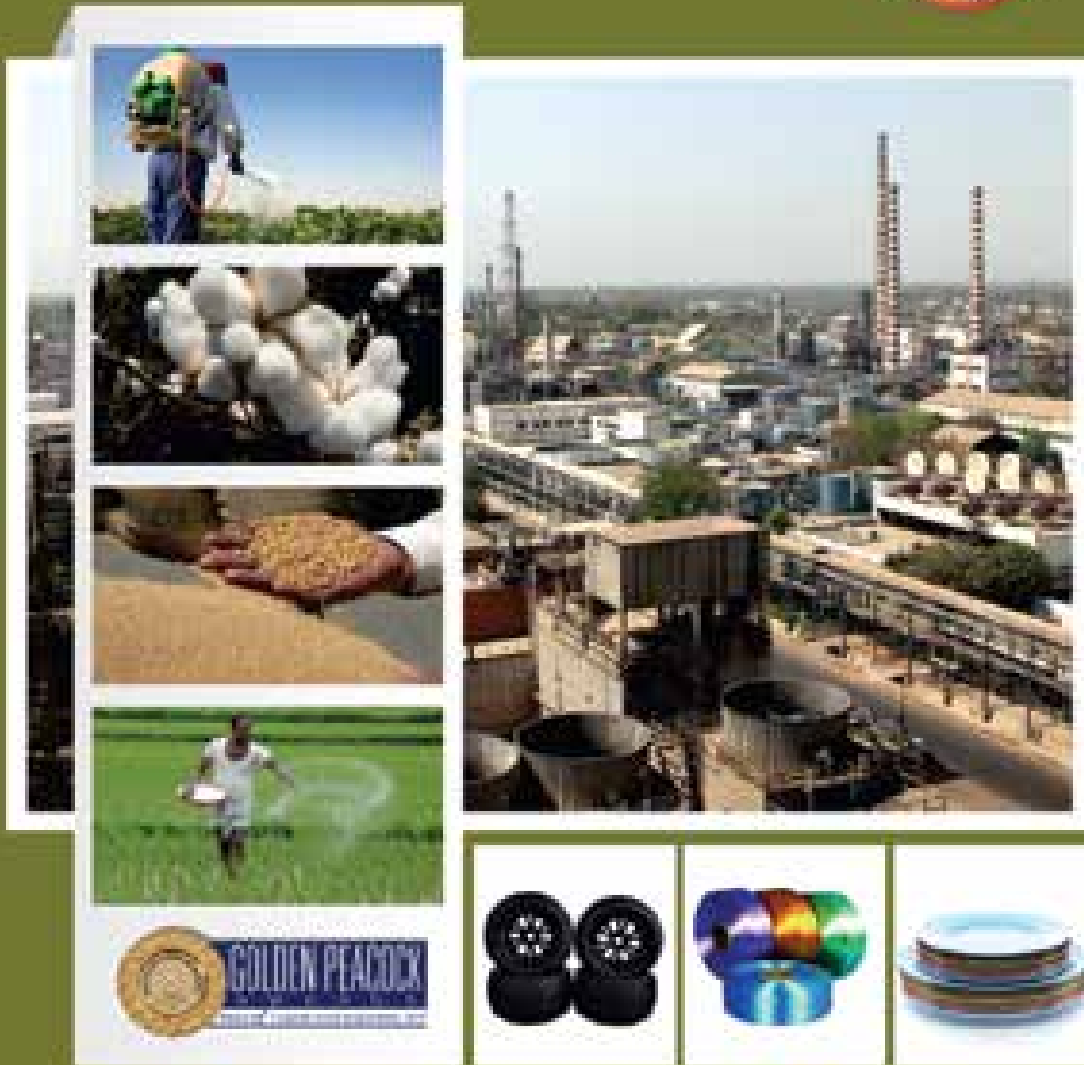
NTPC Ltd and National Council for Cement & Building Materials, (NCCBM), Ballabgarh signed an Memorandum of Understanding (MoU) for condition assessment of Civil structures in NTPC Power Projects & Stations spread across different parts of the country in New Delhi recently. NTPC has an installed capacity of 45548 MW through 18 coal based, 7 gas based, 8 solar renewable, one Hydro and 7 Joint Venture power stations.

MoU signed to speed up coal evacuation logistics

In what could be considered as a move that will yield positive results in coal evacuation logistics from North Karanpura coalfield area of Central Coalfields Limited, a tripartite memorandum-of

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Mr. Raghubar Das, Chief Minister, Jharkhand; Mr. Piyush Goyal, Minister of Power, Coal & Non-Renewable Energy Resources at MoU signing ceremony

understanding (MoU) was signed in the presence of Mr. Raghubar Das, Chief Minister, Jharkhand; Mr. Piyush Goyal, Minister of Power, Coal & Non-Renewable Energy Resources, Government of India, between Ministry of Coal (MoC), Ministry of Railways (MoR) and Government of Jharkhand (GoJ) in Ranchi for formation of a Joint Venture to undertake project development, financing and implementation of identified projects on equity basis. The JV will have an authorized share capital of Rs.1,000cr. While MoC shall have a holding of 64%, MoR and GoJ shall hold 26% and 10% respectively.

MoU signed between HUDCO and IDBI



Dr. M Ravi Kanth, CMD, HUDCO and Mr. Kishor Kharat, MD & CEO, IDBI Bank exchanging MoU documents.

The Memorandum of Understanding was signed between Housing and Urban Development Corporation (HUDCO) and IDBI Bank Ltd. by

Dr. M Ravi Kanth, CMD, HUDCO and Mr. Kishor Kharat, MD & CEO, IDBI Bank in the presence of Mr. NL Manjoka, Director (Corporate Planning) HUDCO, Mr. BK Batra, Dy. MD, IDBI Bank, Dr. D. Subrahmanyam, Sr. Executive Director, HUDCO and Mr. Hiranmoy Biswas, Chief General Manager, IDBI Bank.

The MoU was signed to channelize the subsidy of Government of India under Credit Linked Subsidy Scheme (CLSS), a component of "Pradhan Mantri Awas Yojana (PMAY)" mission in order to provide Housing for All in the country. The Mission will be implemented through four verticals, which inter alia includes Affordable Housing through Credit Linked Subsidy Scheme. CLSS is an important component of the Scheme. Under this component, interest subsidy of 6.5 % p.a. is available on the housing loans upto Rs. 6.00 lakhs which may be availed by the beneficiaries belonging to EWS and LIG

MoU between CCL and Jharkhand Govt. for establishing Sports Academy

Jointly Jharkhand Government and Central Coalfields Limited (CCL) have taken initiative to promote sports in the Jharkhand State with intention to produce sportsmen of national and international level by establishing Sports Academy and Sports University. In this direction, Memorandum of Understanding was signed on 17th June, 2015 between Jharkhand Government and CCL for establishing Sports Academy and Sports University at BNR Chanakya, a hotel in Ranchi, Jharkhand.



Mr. Avinash Kumar and Mr. J. Tiwari inks MoU, while Mr. Gopal Singh, Amar Kumar Bauri, Mr. Raghubar Das and Rajeev Gauba (L-R) applaud at BNR Chanakya, Ranchi



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Registered Office: 10th Floor, Central Centre, East Court Con-14, 7th Floor, South Plaza, New Delhi - 11 00 01. Tel: +91 11 24662296 - 24662278. Fax: +91 11 24662292



MOIL declares 35% dividend in its 53rd AGM



The 53rd Annual General Meeting of MOIL Limited was held recently. Mr. M. P. Chaudhari, Director (Finance) and Chairman of the meeting, welcomed all the shareholders and thanked investors for showing faith in the Company.

In the above meeting, the shareholders approved final dividend @ 35 percent, i.e., Rs.3.50 per share, for the year 2014-15. Earlier, MOIL has paid interim dividend @ 50 percent to the shareholders. The total dividend for the year works out to Rs.8.50 per equity share as against Rs.7.50 per equity share last year.

In his speech, the Mr. Chaudhari highlighted the operational and financial achievements of the company in the financial year 2014-15. He informed to the shareholders that the Company has produced 11.39 Lacs Tonnes of various grades of Manganese ore and has recorded a jump of 9.90 percent in its core production (i.e., production of ferro and silico manganese grades of ore). He also informed that the Company has achieved sales turnover of Rs.823.25 Cr., earned PBT of Rs.650.57 Cr. and PAT of Rs.428.01 Cr. in 2014-15.

Inauguration of Community Hall at village Khapa, constructed by MOIL under CSR

In order to improve the quality of life in villages surroundings to its mines, MOIL is carrying out various schemes under CSR in the fields of health, education, sanitation, skill development,

self-employment, environment awareness, etc.

One such attempt in the field of improving quality of life nearby Gumgaon Mine, a Community Hall at Khapa, Tahsil- Saoner Dist. Nagpur has been constructed with a total area of 707 Sq. Mtrs. At a cost of Rs. 98.00 lakhs having seating capacity of 1000 persons.

The Community Hall was inaugurated by Member of Parliament of Ramtek constituency, Mr. Krupal Tumane in the presence of Mr. Sunil Kedar, MLA, Saoner, Mr. G.P. Kundargi, CMD, MOIL and Mr. A.K. Jha, Director (P&P), MOIL.

Plantation Drive by MOIL Eves Club



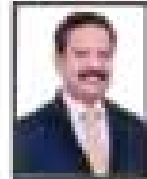
MOIL Eves Club recently undertook mass tree plantation drive in order to promote green awareness. On this occasion, more than 50 ladies of the Eves Club took active part and planted saplings with zeal and enthusiasm. The program was started with lighting of Traditional lamp by the President- Mrs Geeta Kundargi. In addition to tree plantation drive, a programme on Health Awareness was also conducted by Indian Dietetics Association, Nagpur Chapter. Ladies were taught with demonstration by the experts that how adulteration of common food items could be verified at home in easy way with domestically available tools.



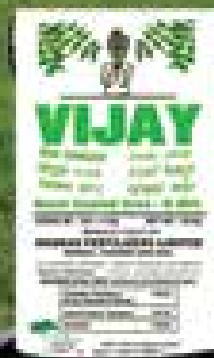
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New Civil Air Terminal at Chandigarh Airport dedicated to the Nation by **Prime Minister Shri Narendra Modi**



Shri Narendra Modi, Prime Minister of India inaugurating the New Civil Air Terminal at Chandigarh Airport alongwith Prof. Kaptan Singh Solanki, Governor of Punjab, Haryana & Administrator, Union Territory of Chandigarh, Shri Parkash Singh Badal, Chief Minister of Punjab, Shri Manohar Lal, Chief Minister of Haryana and other dignitaries. Also seen in the picture are Shri RN Choubey, Secretary(Civil Aviation) - left and Shri RK Srivastava, Chairman, AAI –right.

The New Civil Air Terminal at Chandigarh Airport, a Joint Venture Company by the name Chandigarh International Airport Limited with participation from AAI, Government of Punjab and Government of Haryana, was dedicated to the Nation on 11th September, 2015 by Shri Narendra Modi, Prime Minister of India in the presence of Prof. Kaptan Singh Solanki, Governor of Punjab & Haryana and Administrator of UT of Chandigarh, Mr. P. Ashok Gajapathi Raju, Union Minister of Civil Aviation, Mr. Parkash Singh Badal, Chief Minister of Punjab, Mr. Manohar Lal, Chief

Minister of Haryana, Mr. Sukhbir Singh Badal, Dy. Chief Minister of Punjab and other dignitaries. The Prime Minister took a walk through of the new facility and unveiled plaque in the Arrival area of the building.

The New Civil Air Terminal is capable of handling 1600 pax during the peak hour. The terminal building has been constructed at a total area of 53400 sqm with land area of 300 acres. The terminal building is equipped with state-of-the-art facilities such as check-in counters, VIP Lounge, Car Parking, etc. On the air side of

the airport, Apron and taxi track have been constructed. Apron is capable of parking 08 nos. aircraft. The Civil Air Terminal has been constructed at a total cost of Rs. 939 crores, including land cost, the cost of construction being Rs. 68,000/- per sqm. The New Civil Air Terminal to a great extent cater to the passenger facilities be it comfort, convenience, aesthetics, eco-friendliness and so on. The facility will immensely contribute towards tourism in the State in particular and give impetus to economic development of the region.



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- A pioneer in the chemical field as well, producing more than 20 industrial chemicals

The way forward

- To set up a new plant to produce 1.27 million tonnes of urea per annum
- To set up fertilizer complex at Bafra in consortium with OIL, GAIL and FCI, through coal gasification route
- To set up JV projects for urea in consortium with countries of Middle East
- To enter into long term off take agreements for urea producers and plants
- Strong focus on sustainable development



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Secretary (Fertilizers), DoF Visits RCF



Mr. Anuj Kumar Bishnoi, IAS, Secretary (Fertilizers), visited Trombay unit of Rashtriya Chemicals & Fertilizers Ltd (RCF) recently. Mr. R. G. Rajan, Chairman & Managing Director, RCF, Mr. C.M.T. Britto, Director (Technical), Mr. Ashok Ghasghase, Director (Mktg.), Mr. Suresh Warior, Director (Fin.) and senior executives accompanied him during their visit. He complimented company's excellent performance over the years also understood plant operations and functions during the plant visit. ■■■

Development of a Civil Enclave at Purnia, Bihar comes under consideration zone

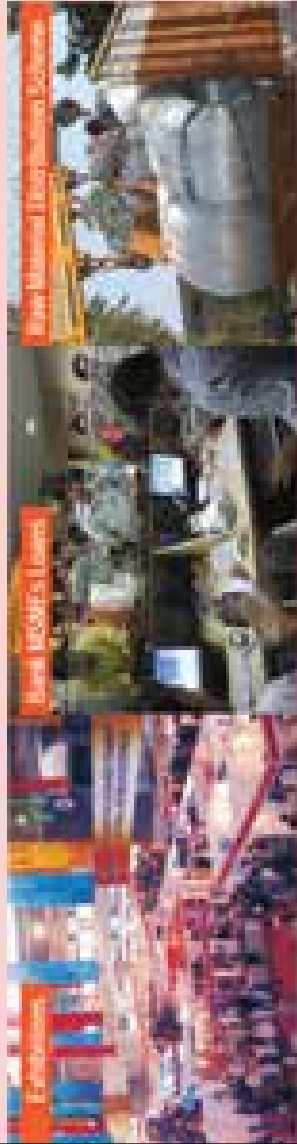
AAI had been putting its efforts to increase the Regional & Remote Area air connectivity across the country. In this endeavour, AAI is planning to develop a Civil Enclave on the IAF Airfield at Purnia, Bihar. A team of officers from AAI undertook site visit to the Air Force Station, Purnia recently. At present, the Air Force Station has runway suitable for wide bodied aircrafts. The requirement of land for setting up of Civil Enclave has been assessed by the team and will be taken up with the State Govt. Purnia, is located in the North Eastern part of Bihar with a

population of nearly 5 lacs and is accessible to the Northern part of Bengal extending upto Biratnagar in Nepal. Due to its strategic location, the need for setting up of Civil Enclave for operation of Civil flights had been under consideration for the past two decades. The Air Force Station has only day-time operations. The nearest airport is located at Bagdogra at an aerial distance of 180 kms, which at times, remains inaccessible for air traffic due to bad weather conditions. Since, Purnia is having advantage due to its geographical location on a flat plateau; the operations at this

airport shall not be affected by such bad weather conditions.

Multi-modal Transport Integration for metro airports

Considering the rapid growth of air traffic there is a need to optimize the city side traffic & transport connectivity. As a first step towards this initiative, AAI has undertaken 'Multi-modal Transport Integration Study' at six metro airports under the direction of MoCA. An MOU has been signed between AAI and RITES for Comprehensive Study and preparation of Conceptual Plan in co-ordination with the airport developers/operators. ■■■



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BHEL Commissions **Sudan's Largest Thermal Power Plant**

Bharat Heavy Electricals Limited (BHEL) commissioned the 500 MW Kosti Thermal Power Station (TPS) in Sudan recently. Significantly, Kosti TPS (4x125 MW) is now Sudan's largest Power Plant. BHEL has executed this project on Engineering, Procurement and Construction (EPC) basis, having designed, manufactured, supplied and installed the complete power project (4 units of 125 MW each) including associated civil works.

The project uses crude-oil from South Sudan as fuel, for which BHEL has designed special boilers. All the major equipment for the project viz. boilers, steam-turbines, generators, Controls & Instrumentation (C&I), transformers, etc., have been manufactured in-house. The company has also constructed a canal from the White Nile River to supply water for the project. The project is funded by Govt. of India's Line of Credit of USD 350 million.

Renovation & Modernisation (R&M) of 110 MW Unit at Harduaganj Thermal Power Station by BHEL

BHEL has renovated, modernized and upgraded 110 MW Unit-7 at Harduaganj Thermal Power Station (TPS) Plant of Uttar Pradesh Rajya Vidyut Utpadan Nigam Limited (UPRVUNL). After successfully running for over 30 years, this unit, originally supplied and commissioned by BHEL, was undertaken for Renovation & Modernization (R&M).

Following the R&M, not only was the working life of the machine extended by another 15-20 years, the capacity was also uprated to 120 MW from its original capacity of 110 MW.

With this, BHEL has once again showcased its inherent strength of being fully geared for R&M and uprating of old thermal power plants through in-house state-of-the-art technology, engineering capabilities and by incorporating the latest products/systems in renovated units. Significantly, this is the 8th such unit successfully renovated, modernised and uprated by BHEL from its original rating of 110 MW to 120 MW.

BHEL commissions 500 MW Thermal Unit at Vindhyachal STPS

Bharat Heavy Electricals Limited (BHEL) has added one more coal-based power plant to the grid by successfully commissioning the 500 MW Unit-13 of Vindhyachal Super Thermal Power Station (STPS), Stage-V of NTPC. The project is located in Vindhyachal in Singrauli district of Madhya Pradesh.

Significantly, BHEL has earlier commissioned 6 units of 500 MW rating each at Vindhyachal power station. With the commissioning of this unit, BHEL has now commissioned 7 sets of 500 MW aggregating to 3,500 MW, the highest by BHEL in a power project. ■■■

IFCI Group's Gesture Towards **Digital India**



IFCI launched the online access of Venture Capital Funds for Scheduled Castes at the Ministry of Social Justice and Empowerment recently. Ms. Anita Agnihotri, IAS, Secretary Social Justice and Empowerment, launched the same during the DIGITAL INDIA WEEK held by the Prime Minister of India. JS, Mr. B. L. Meena, IAS, Mr. Achal Gupta, Dy, MD, IFCI were also present on the occasion. ■■■

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GAIL Registers Turnover (Net of Excise) of Rs. 12,519 Cr. in Q1 of FY 2015-16, Net profit at Rs. 424 Cr.

GAIL (India) Limited registered a Turnover (Net of Excise) of Rs 12,519 cr. in the first quarter of Financial Year 2015-16 as against Rs 13,337 cr. in the corresponding quarter of the previous year. Profit Before Tax stood at Rs 651 cr. while Profit After Tax was Rs 424 cr. for the quarter ending June 2015 as against Rs 890 cr. and Rs 621 cr. respectively in the corresponding period last year. The decrease in profit was mainly due to lower price realization of LPG, other Liquid Hydrocarbons & Petrochemicals and reduced production of LPG, Petrochemicals due to shut down in Pata Petrochemical plant, increased interest and depreciation charges after commissioning of Petrochemical expansion.

During the quarter, the revenue from Natural Gas Transmission were higher by 40 percent at Rs 925 cr. compared to Rs 660 cr. The sales from Natural Gas Marketing stood at Rs 10,581 cr. as against Rs 11,669 cr. in the corresponding quarter of the previous year while the revenue from Petrochemicals business was Rs 516 cr. as against Rs 993 cr. earlier.

The revenue from LPG transmission business increased by 23 percent to Rs 136 cr. as against Rs 111 cr. in the corresponding previous period. The net revenue from LPG and other Liquid Hydrocarbons business during the first quarter of the current financial year stood at Rs 929 cr. as against Rs 1,260 cr. in the corresponding quarter of previous year. Natural

gas transmission during the first quarter of the current financial year stood at 87.48 MMSCMD as against 96.91 MMSCMD during the corresponding quarter in the previous financial year while LPG transmission stood at 689 TMT as against 832 TMT earlier. Polymer sales during the first quarter of FY 2014-15 were 50 TMT against 87 TMT during the corresponding quarter in the previous year. LPG and other Liquid hydrocarbons sales stood at 278 TMT as against 323 TMT earlier. The quantity of polymer production was 51 TMT as against 98 TMT earlier while LPG and other Liquid hydrocarbons production stood at 278 TMT as against 327 TMT in the corresponding quarter of the previous year. ■■■

Paradeep Refinery's South Oil Jetty Inaugurated by Minister of Road Transport, Highways & Shipping



The South Oil Jetty of Paradeep Refinery was inaugurated by Mr. Nitin Jairam Gadkari, Union Minister of Road Transport, Highways & Shipping in the presence of Mr. Dharmendra Pradhan, Union Minister of State (Independent Charge) for Petroleum & Natural Gas. Mr. Sanjay Gupta, CMD and Mr. Ashwani Soni, Director (Projects), Engineers India Ltd. (EIL) were also present on the occasion. EIL has provided Project Management Consultancy Services for the project to IOCL. ■■■



खाद्य सुरक्षित भारत के लक्ष्य की ओर अग्रसर

● खाद्यान्न, खाद्य तेल और दालों के आयातक

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Commander-in-Chief, Myanmar Defence Forces visits GSL

A 22 members delegation from Myanmar led by Senior General Min Aung Hlaing, Commander-in-Chief of Myanmar Defence Forces visited GSL recently. During the visit, Senior General Hlaing had discussions with RAdm Shekhar Mital, NM, IN (Retd), CMD GSL on wide areas of maritime strategy, fleet operations / deployment, Ship building and ship repairs.

Senior General Hlaing was conducted around the shipyard by CMD GSL and apprised of the ongoing series construction of OPVs for Indian Defence forces as well as for export markets. The Myanmar delegation was also shown massive infrastructure augmentation being undertaken for MCMV project.



Senior General Hlaing with RAdm Shekhar Mital, NM, IN (Retd), CMD GSL

Earlier a presentation was made to the Myanmar delegation on the growth trajectory of GSL, its in-house design capability, product profile and future potential. The delegation showed keen interest

in OPVs. The Myanmar delegation appreciated GSL for its R&D efforts and modernization/infrastructure augmentation being undertaken to meet the future defence requirements. ■■■

Cochin Shipyard Limited (CSL) Launches The Seventeenth Fast Patrol Vessel



Cochin Shipyard launched the seventeenth of the 20 Fast Patrol Vessels (BY 517) being built for Indian Coast Guard. The vessel was named 'ICGS ARUSH' and launched by Smt. Jyothi Devanand, wife of DIG G Devanand, Coast Guard Refit & Production Superintendent, Kochi in a simple ceremony at Cochin Shipyard. Cmde K. Subramaniam, CMD, CSL, DIG M.V. Pathak, Commander District IV, Capt R. S. Sundar, Director (Operations) CSL, Mr. D Paul Ranjan, Director (Finance), CSL, and other senior officials of CSL and ICG were present on the occasion. ■■■



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Engineers India pays Final Dividend to Govt. of India

Engineers India Limited (EIL) paid Rs. 46.74 cr. as Final Dividend to Government of India for the Financial Year 2014-15. The dividend cheque was presented to Mr. Dharmendra Pradhan, Minister of State (I/C), Ministry of Petroleum & Natural Gas (MoP&NG) by Mr. Sanjay Gupta, C&MD, EIL recently. On this occasion, Mr. K D Tripathi, Secretary, senior officials of MoP&NG, Functional Directors on EIL Board and Company Secretary of EIL were also present. The Final Dividend is @ Rs. 2.00 per share of the Company (of the face value of Rs. 5/- each). Government of India holds 69.37 percent of the paid up share capital of the Company. EIL is



The dividend cheque being presented to Mr. Dharmendra Pradhan, MoS (I/C), MoP&NG by Mr. Sanjay Gupta, C&MD, EIL

one of the leading Engineering, Procurement, Construction (EPC) and Total Solutions Consultancy Organizations in the fields of Petroleum Refining, Petrochemicals, Pipelines, Oil & Gas Terminals & Storages,

Fertilizers, Mining & Metallurgy and Infrastructure projects. The Company is also working in diversified areas of Water & Waste Management and has made inroads into the areas of Nuclear, Solar & Thermal Power. ■■■

WCL Stars Shines in **Civil Services Examination 2015** Felicitated

Four aspirants from Western Coalfields Limited stood high in Civil Services Examination 2015. Mr. Piyush Fulzele All India Rank 795, Ms. Sweta Patil All India Rank 835 dependents of WCL employee and Smt. Arpit Sagar All India Rank 378 and Ms. Megha Godara All India Rank 1123, Management Trainees of the company successfully passed the All India Civil Services Examination and made the entire WCL family proud. For their outstanding achievement all four were felicitated at the hands of CMD, Western Coalfields

Limited Mr. Rajiv R. Mishra in the presence of Special Guests Mr. A. K. Singh, Former CMD, CMPDIL, Mr. A K Jha, Director (Technical), MOIL in WCL H.Q. recently.

While speaking on the occasion, Mr. Mishra said these bright four have not only made proud to

WCL and their families but also they have enhanced respect of entire Coal Industry. Mr. S. S. Malhi, Director (Tech.), Mr. B. K. Mishra, Director Technical (Project & Planning) and Dr. Sanjay Kumar, Director (Personnel) of WCL were prominently present during felicitation ceremony. ■■■



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REC Disburses Rs. 16,070 Cr. to Telangana Power Plant



Mr. Rajeev Sharma, CMD, REC handing over the cheque to Mr. K. Chandrashekar Rao, Chief Minister, Telangana

REC Rs.16,070 cr. loan to Telangana for construction of 4000 MW Yadadri power plant. Rajeev Sharma, CMD, REC on 11th August, 2015 handed over the cheque to Mr. K. Chandrashekar Rao, Chief Minister of Telangana. The credit support is given to TSGENCO for setting up an Ultra Mega Power Project of capacity with 5 x 800 MW at Yadadri. MD of TSGENCO and other senior officials from State Government and REC were also present. The disbursement of Rs.16,070 cr. is

highest ever extended by REC in a single instalment. Earlier, REC, a Navratna PSU, had signed a MoU with TSGENCO in February, 2015 for providing the financial assistance to the extent of Rs. 20,000 cr. This was to facilitate Telngana's ambitious program of developing Thermal Power projects during 12th plan for capacity addition of about 4000 MW. REC will continue to play a leading role among the development partners active in Telangana's power sector development.

REC Total Income increases by 21 percent

Rural Electrification Corporation (REC) has declared its financial results for the quarter ended 30th June, 2015. In a meeting held recently the Board of Directors of the company approved the limited reviewed Financial Results. Total Income of the company for the quarter ended on 30th June, 2015 has increased to Rs.5,710 cr. as against the corresponding quarter ended on 30th June, 2014 of Rs.4,707 cr., registering an increase of 21percent for the quarter.

Profit after tax of the company for the quarter ended on 30th June, 2015 has increased to Rs.1,479 cr. as against the corresponding quarter ended on 30th June, 2014 of Rs.1,283 cr. registering an increase of 15percent for the quarter. EPS for the quarter ended 30th June, 2015 is Rs.14.97. Net worth of the company has increased to Rs. 26,267 cr.

The Loan Asset Book of the company as on 30th June, 2015 has increased to Rs. 1,86,420 cr. and the outstanding borrowings is Rs.1,55,772 cr. ■■■



A.K. Jha takes over as CMD NTPC

Mr. A.K. Jha, Director (Technical), NTPC has taken over the additional charge of the post of the Chairman & Managing Director, NTPC w.e.f. September 1, 2015.

Mr. Jha is a graduate in Mechanical Engineering from BIT Sindri, Ranchi University and has done LLB from Delhi University. He joined NTPC in 1977 as Executive Trainee (2nd Batch). He has rich and varied experience of 38 years in NTPC in all the areas of Power Project i.e. Design & Engineering, Project Planning & Monitoring and Project Construction & Management.



HUDCO's Long Term Credit Rating upgraded to 'AAA'

India Rating and Research Pvt. Ltd. (Fitch group) has assigned HUDCO "AAA" rating with a stable outlook for the forthcoming domestic bonds Issue. India Ratings (Ind-Ra) has upgraded HUDCO's Long – Term Credit Rating to 'IND AAA' and affirmed Short-Term Credit Rating at 'IND A1+'.

The upgrade reflects Ind-Ra's expectation of change in HUDCO's role to a public policy institution from a public finance institution earlier. Ind-Ra expects GoI would continue to provide timely support to HUDCO as reflected by the recent GoI notification which has authorised HUDCO to issue tax-free bonds to the tune of INR 50bn in this fiscal. GoI has very well acknowledged the fact that HUDCO is a primary policy

institution with a social mandate to meet the housing needs of economically weaker section (EWS)/ low income group (LIG) category. Hence it has assigned HUDCO as one of the central nodal agencies to channelize and monitor the progress of the credit-linked subsidy under Housing for all (HFA) by 2022 / 'Pradhan Mantri AwasYojana (PMAY)' to the lending institutions.

HUDCO has mobilised refinance assistance of INR 17bn in FY15 from NHB under its rural housing fund and urban housing fund. The access to cheaper funds has helped HUDCO to increase its loan exposure to social housing for the economically weaker sections and low income groups, as well as to non-commercial urban infrastructure. The incremental

cost of funds would reduce further in FY16 as GoI has notified HUDCO to issue low-cost tax free bonds of INR 50bn. HUDCO has posted an impressive Profit After Tax (PAT) of Rs.777 cr. (provisional) as against Rs. 726.34 cr. in the previous year. HUDCO is a more profitable entity than most of its peers in terms of better higher net interest margin (NIM), pre-provision operating profitability (PPOP) and return on average assets (RoAA).

During 2014-15, HUDCO mobilized total resources aggregating to Rs. 5074.37 cr. at a weighted average borrowing cost of 8.18 percent (i.e. 38 bps above 10 yr. G.Sec. as on 31.03.2015). Further, HUDCO maintains a healthy Tier-I Capital Ratio, which is 51 percent in FY 2015. ■■■

GRSE Launches three Water Jet Fast Attack Crafts (WJFACs)



Garden Reach Shipbuilders & Engineers Ltd, Kolkata launched the three ships together (First, second and third of the series of Four Water Jet Fast Attack Crafts) for Indian Navy from Raja Bagan Dock Yard recently. The ships were launched by Ms. Medha Murugesan, wife of Vice Admiral P Murugesan AVSM, VSM, Vice Chief of Naval Staff who graced the occasion as the Chief Guest in the presence of Rear Admiral A. K. Verma, VSM CMD and other dignitaries from the armed forces and civil administration. During this ceremony, the three ships were named as Tarmugli, Tillanchang & Tihayu respectively. ■■■

किसानों की सेवा में पिछले चार दशकों से...



समय की सेवा में पिछले अठारह वर्ष देशों की सर्वोत्तम एन.एफ.एल. में न केवल किसानों को अपने द्वार पर अव्यक्ति पूर्णतः स्वतंत्र करवाया है बल्कि उन्हें नृमि उत्पादन की जमीन पर जायकालों की प्रदान की है।

देशों की संवृद्धि परामर्श को बढ़ावा देने के लिए एन.एफ.एल. ने पर्यावरण-मित्र, जीव जैविक पूर्णतः स्वतः स्वतः स्वतः स्वतः का विकास किया है। कंपनी विशेष विशेष परामर्श पर कार्य कर रही है जहां किसानों को कृषि सम्बन्धी सभी संशुद्धि जैसे कि बीज, कीटनाशक, इस्पात, कर्मचारी तथा सभी प्रकार के परिवर्तन एक ही छत के नीचे मिल सकेंगे। कंपनी एन.एफ.एल. का परामर्श बढ़ाने के लिए इसका परामर्श शुरू करने का रही है।

कंपनी का मुख्य उद्देश्य कृषक संवृद्धि की संवृद्धि एवं स्वतः विकास को बढ़ावा देने है।



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किसानों की संवृद्धि में कि बीजों की सेवा में किसानों को सर्वोत्तम एन.एफ.एल. में न केवल किसानों को अपने द्वार पर अव्यक्ति पूर्णतः स्वतंत्र करवाया है बल्कि उन्हें नृमि उत्पादन की जमीन पर जायकालों की प्रदान की है।

Integrated Rating Methodology released



The integrated rating methodology for state power distribution utilities was developed by Ministry of Power with active involvement of PFC, REC, CEA, CERC distribution utilities and credit rating agencies CRISIL, ICRA and CARE. The methodology was given final shape in consultation with Department of Financial Services – MoF, IBA and major Public Sector Banks. The methodology was unveiled by Ministry of Power in the Power Ministers Conference in July 2012. PFC was mandated to coordinate the rating exercise to be conducted annually rating agencies ICRA and CARE were selected to carry out the annual rating exercise for three years. The exercise cover 40 state power distribution

utilities and does not cover private utilities and state power/energy departments. So far rating exercises has been completed for the rating years 2011-12 and 2012-13. Now the third exercise for the rating year 2013-14 covering 40 state distribution utilities has been completed by designated credit rating agencies and the ratings declared by Minister of State (I/C) for Power, Coal and MNRE Mr. Piyush Goyal recently in a function organised at SCOPE Complex. All the four state distribution utilities in the state of Gujarat and the distribution utility in Punjab figure in the top most category of A+. Two utilities have been placed in A category, 23 utilities in category B+ / B and 10 utilities in category C+ / C. ■■■■

PFC Declares Quarter 1 FY 2016 Results

Power Finance Corporation in its Board Meeting held recently declared their Quarter 1 FY 2016 results, wherein in comparison to Q 1 FY 2015 among others the Profit After Tax is increased by 9 percent, Net Interest Income increased by 22 percent, Loan Assets increased by 13 percent and Net worth Increased by 15 percent. The Capital Adequacy Ratio stood at 20.71 percent. Major Loans sanctioned of Rs. 7,669 cr. to Ennore SEZ Supercritical TPP of Tamil Nadu Generation and Distribution Corporation Limited, Rs.5,832 Cr. to Manuguru TPS of Telangana Power Generation Corporation Ltd, Rs.1,800 Cr. to SJVNL for their Buxar Power Project and Rs. 1,185 Cr. to NLC Tamil Nadu Power Limited. ■■■■

New Barge for Bunkering throughout the year

Sanghrajka-4 – 1500 tonne capacity barge has been deployed at Cochin Port for bunkering 24x7 throughout the year. This barge can supply bunker to transiting ships in the outer roads even during monsoon. The barge, chartered by Geostan Marine Pvt Ltd, with a capacity of 1500 tons can carry 1400 MT of black oil and 200 MT of white oil. It has been deployed to provide bunker to transiting ships in the outer roads of Cochin Port. The vessel built in 2014 is licensed to operate 24x7 throughout the year. With this the fleet of barges in the bunker trade at Cochin Port has gone up to 6. ■■■■

Picture shows the barge being greeted at its inaugural service by Chairman and senior officials of Cochin Port Trust.



Cross Border Air Traffic Flow Management (ATFM), Workshop held at New Delhi

Airports Authority of India hosted the first Asia Pacific Cross Border Air Traffic Flow Management (ATFM) Workshop in New Delhi, at Radisson Blue Plaza, New Delhi from 3rd September 2015 to 4th September 2015. The workshop was jointly conducted by International Civil Aviation Organization (ICAO) and International Air Transport Association (IATA). The workshop was intended to highlight the importance of cross border Air Traffic Flow Management (ATFM) to as many aviation personnel as possible, sharing some of the existing cross border ATFM/CDM implementations and benefits of cross border. The workshop was attended by over 70



aviation professionals from various airports across India, airlines, Indian defense establishment, AAI including 30 representatives from ten countries such as China, Japan, Thailand, Singapore, Nepal, Maldives, Seychelles. The two-day Workshop consisted of

a series of classroom-based lectures. Opportunities for detailed discussions on relevant topics such as principles of cross border ATFM, and the distributed multi-nodal ATFM concept for Asia Pacific Region will enhance the experience of participants. ■■■

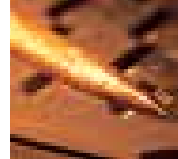
Cochin Shipyard delivers the Fast Patrol Vessel (BY 514) to the Indian Coast Guard-51 days ahead of Schedule

CSL delivered the fourteenth of the series of twenty Fast Patrol Vessel "ICGS Apoorva" under construction for the Indian Coast Guard. The Protocol of Delivery and Acceptance was signed between Capt R.S. Sundar, Director (Operations), CSL and Commanding Officer (Designate) of the vessel Cmdt.(JG) Dinesh Dogra. DIG T P Sadanandan, Principal Director (Material), DIG G Devanand, CGRPS (KOC), and other senior officials of ICG and



CSL were present on the occasion. The vessel will be operated from the Coast Guard Station at Goa. The yard has consistently

performed beyond expectations in that it has delivered 7 ships in FY 2014-15 and 4 ships in FY 2015-16. This is indeed a commendable achievement. The yard delivered 7 ships consisting of 6 Fast Patrol Vessels for Indian Coast Guard and 1 Platform Supply Vessel for Norwegian owner in 2014-15. BY 514 the fourth ship being delivered in 2015-16. The other three being Fast Patrol Vessels for ICGS & 1 Buoy Tender Vessel to Directorate General of Light Houses and Light Ships. ■■■



SAIL's Modernized Plant at IISCO

Despatch First Export Consignment of Blooms

Steel Authority of India Ltd.'s IISCO Steel Plant (ISP) dispatched its first export consignment of 45 wagons of Steel blooms recently. The consignment amounting to 2764 Metric Tones was flagged off from the West Yard in ISP. Steel produced by ISP conforms to stringent quality norms.

This consignment is exported to Nepal for their urgent rehabilitation work after the massive earth quake. The blooms will be used for rolling out quake resistant TMT bars. Out of the total order of 2 rakes of 5500 metric tones, this is the first consignment and the second will be dispatched in first week of August.

Recently, PM Shri Narendra Modi dedicated the modernized and expanded IISCO Steel Plant to the nation. The plant not only tripled its hot metal capacity from 0.85 to 2.9 million tones per annum (MTPA) but also ushered in a new era of green and high quality steelmaking. Soon after the stabilization of its new and modernized units, ISP is fast catering to the needs of both national and international customers with its quality products.

Earlier, SAIL had donated approximately 50 tones of GC Sheets to Nepal for their rehabilitation work through Indian embassy in Nepal. ■■■

SCI's Q1 Profits Soar due to Tankers

The Shipping Corporation of India (SCI) declared its unaudited financial results for the quarter ended 30th June 2015 posting a net profit of Rs. 163.54 cr. as against a net profit of Rs. 49.50 cr. during the quarter ended 30th June 2014 and a net profit of Rs. 101.49 cr. during the quarter ended March 2015. SCI had registered a net profit of Rs. 200.93 cr. for the year ended 31st March 2015. The quantum leap in profits during the quarter has been attributed to the rally in tanker markets aided by the continued slide in world crude oil prices. SCI currently owns 69 vessels corresponding to 5.89 million dead weight tones and 3.29 million gross tones which include thirty five tankers. ■■■

Visit of Dy. US Trade Representative at Cochin Post Trust



A trade delegation from the executive office of the President of US on tour to

India visited the Cochin Port Trust recently and held detailed discussions to explore avenues of closer

commercial co-operation on Port led investments. The team led by Mr Robert Holleyman, Dy. US trade representative and Sr officials from the US embassy in India held discussions with Mr. Paul Antony, Chairman, Cochin Port and Dr. C Unnikrishnan Nair, Traffic Manager. The team discussed on commencing a direct ship service connecting Cochin to the US East Coast. The team also evinced keen interest in commercial developments related to outer harbour in Cochin Port. ■■■

WAPCOS Completes **Stung Tasal Dam** in Cambodia



Mr. Bun Hean, Secretary of State, Ministry of Water Resources and Meteorology, Kingdom of Cambodia presenting Completion Certificate of the Stung Tasal Dam in Aoral District, Kampong Speu Province of Cambodia to Mr. R.K. Gupta, CMD, WAPCOS in Phnom Penh.

Mr. Bun Hean, Secretary of State, Ministry of Water Resources and Meteorology, Kingdom of Cambodia presented the completion certificate of the Stung Tasal Dam in Aoral District, Kampong Speu Province of Cambodia to Mr. R.K. Gupta, Chairman Cum Managing Director, WAPCOS Limited in Phnom Penh, on the occasion of visit of Mr. Mohammad Hamid Ansari, Hon'ble Vice President of the Republic of India to Cambodia accompanied by Mr. Sanwar Lal Jat, Minister of State, Ministry of Water Resources, River Development and Ganga Rejuvenation, Government of India, Members of Parliament, Secretary (East) Mr. Anil Wadhwa and Additional Secretary Mrs. Monika Kapil Mohta, Ministry of External Affairs, Government of India.

The Stung Tasal Dam, a Concrete

Faced Rockfill Dam is first of its kind in Cambodia built by state of the art technical expertise of WAPCOS, under dispersive soil conditions in the region. The Dam is 21 m high, 720 m in length with water storage of 140 MCM. The Dam will be instrumental in increasing the rice production and fish cultivation in the region with the increased surface water availability. The Dam will benefit command area of 10,000 hectares and has been built under Government of India Line of Credit of US Dollars 30 Million. The Phase - II of the project includes construction of canals for which the Kick-off meeting was also held on the same day. The Royal Government of Cambodia in the Completion Certificate have appreciated the professional approach of WAPCOS team. The Royal Government of Cambodia conveyed thanks to

the Government of India on this occasion for supporting the construction of Stung Tasal Dam.

WAPCOS which is also executing the Phase - II of this project is actively involved in various other developmental projects in Cambodia in the fields of Irrigation, Power Transmission, Ground water Development, Surface water Development and Trenchless technology for Drainage. The important projects presently being executed by WAPCOS include 230 KV Transmission Line from Stung Treng to Kratie, Master Plan for Siem Reap River Basin, Ta Prohm Temple Drainage Project, Supply & Installation of Hand pumps for Augmentation of Rural Water Supply, Study of Ground water Resources for two Districts of Kampong Speu Province, Redevelopment of India - Cambodia Friendship School.

Mr. Bun Hean and Mr. R.K. Gupta mutually agreed and committed to continuing technical co operation for water resources projects and to enhance friendly relations between the two countries.

WAPCOS Successfully completes Champassak Irrigation Project in Lao PDR

Mr. Maykong PHONEPHOMM-AVONG, Director General, Department of Irrigation, Ministry of Agriculture and Forestry Lao PDR presented the Work completion and handing over certificate of Champassak Irrigation

project, to Mr. R.K. Gupta, Chairman Cum Managing Director, WAPCOS Limited in a ceremony at Presidential Palace "Ho Kham", Vientiane, Lao PDR in the presence of Mohammad Hamid Ansari, Hon'ble Vice-President of the Republic of India and Bounnhang VORACHITH, Hon'ble Vice President of Lao PDR during the visit of Hon'ble Vice President of the Republic of India to Laos recently.

The ceremony was also attended by Mr. Sanwar Lal Jat, Minister of State, Ministry of Water Resources, River Development and Ganga Rejuvenation, Government of India, Members of Parliament, Secretary (East), Mr. Anil Wadhwa and Additional Secretary Mrs. Monika Kapil Mohta, Ministry of External Affairs, Government of India and other senior officers and delegates from India.

Six large irrigation schemes namely Savang, Sakmuang, Thaphosy, Somhong, Ban He and Muangsen Irrigation Schemes have been developed in this project. Total cost of the project is 17.34 M USD. This project will serve 17 villages in 6 districts of Champassak



Work completion and handing over certificate of Champassak Irrigation project being presented by Mr. Maykong PHONEPHOMMAVONG, Director General, Department of Irrigation, Ministry of Agriculture and Forestry Lao PDR to Mr. R.K. Gupta, Chairman CMD, WAPCOS in a ceremony at Presidential Palace "Ho Kham", Vientiane, Lao PDR in the presence of Mohammad Hamid Ansari, Hon'ble Vice-President of the Republic of India and Bounnhang VORACHITH, Hon'ble Vice President of Lao PDR.

province, with a total command area of 5953 hectares. Earlier, there was only one crop grown by the farmers during rainy season, with these new schemes now operational, farmers shall be able to harvest 2-3 crops per year. This Project will immensely contribute towards Socio Economic Growth of Lao PDR.

WAPCOS is also Project Management Consultant for "Construction of Storage Dams and Development of

Irrigation System" for Nam Xang Dam, Xayabury Province and Nam Nga Dam, Vientiane Province, "230 kV Double Circuit & 115 KV Multi Circuit Transmission Line and associated Substation Projects (Thabok-Nabong-Khoksaad)" and Construction of 6MW Namsong Hydropower Project & 115 kV Double Circuit Transmission Line Project & associated Substations (Paksong/Jiangxai/Bangyo) and Purchase of equipment for Rural Electrification. ■■■■

Pawan Hans Honoured for **Best General Aviation Company** Promoting Remote & Regional Connectivity



Pawan Hans Limited has been awarded with the – Civil Aviation & Tourism Award-2015 in recognition for Promoting Remote & Regional Connectivity as Best General Aviation Company. The award was presented by Minister of Civil Aviation, Mr. P Ashok Gajapathi Raju to Dr. B.P Sharma, CMD, Pawan Hans Limited during 8th International Conference on Indian Civil Aviation & Tourism Awards 2015 in the eminent presence of Minister of State of Tourism, Culture & Civil Aviation, Dr. Mahesh Sharma, and other Dignitaries. ■■■■

Union Steel Minister inaugurates Steel Unit at Gwalior

Union Minister of Steel and Mines, Mr. Narendra Singh Tomar inaugurated a Steel Processing Unit established under Public Private Partnership between SAIL and Prime Gold Private Limited. The unit has been set up in Billowa, Madhya Pradesh under a Joint Venture. M/s Prime Gold has 74% and SAIL has 26% stakes in this unit, which will produce one lakh tonnes of world class TMT steel and 60,000 tonnes billets will be supplied from SAIL plants to this unit annually. With setting up of



Union Minister of Steel and Mines, Mr. Narendra Singh Tomar along with other dignitaries lighting the lamp

the unit, a large number of direct and indirect employment opportunities will also be generated. ■■■

Personalia



Mr. Prabal Basu
takes Over as CMD,
Balmer Lawrie & Co. Ltd.



Mr. L. C. Goyal, IAS
takes charge as CMD,
ITPO



Mr. D. Bandyopadhyay
takes over as Director (HR),
BHEL



Mr. K. Swaminathan
takes over as Director [Service
Business], BalmerLawrie& Co. Ltd.



Mr. Ved Prakash Mahawar
takes over as Director
(Onshore), ONGC



Mr. Sudhir Sharma
takes over as Director
(Exploration), ONGC Videsh