

COMMENT

Some readers may have caught a recent lively radio debate in BBC on the question of why engineers and scientists are so woefully under-represented in the ranks of our national decision-makers.

The show produced some interesting food for thought. The point was made - and made well - that **at a time when many of the country's big challenges require technical solutions, the overwhelming majority of those deciding how they should be met are from non-technical backgrounds.**

The Lok Sabha is heavily populated by lawyers, actors, civil servants, trade union officials, school/college drop-outs and career political activists.

Engineers and scientists are harder to find, by contrast. The twin questions discussed on the BBC were why is this, and does it matter? As to the why, it may well be that engineers are too busy getting on with the business of developing things, making sure they work and getting them produced to have the time or inclination for the endless talking, trimming, compromising and in some cases evading that comes with a political career.

Does this matter? The Engineer would suggest it does, for the very reason stated earlier. Look at a list of the big challenges confronting the country and see how many of them will rely in whole or part on the judicious deployment of technology to overcome them - Energy provision, infrastructural issues, flood protection, transport policy and the establishment of a sustainable high-tech economy are just a few.

Of course there is no reason why the lawyers, actors and the rest cannot make reasonable decisions on these issues. And they would point to the availability of an army of specialist advisers to help them make those judgements.

But when all is said and done, advisers advise and legislators decide. A few more engineers and others with a broader understanding of the technology that underpins the policy would be a welcome addition to our body politic. Any takers?!

IIPE NEWS

03

The Jharkhand Chapter of IIPE at Mesra, Ranchi, successfully conducted a Symposium on **Lean Manufacturing Implementation**, early September. Our Past Chairman, Shri Khanna's visit to this, is an eye opener about the great work being done by Ranchi members and Jharkhand Industries Association – A Report.

Plus a brief about the proceedings of NHQ's Executive Committee meeting.

**Improvement
Using Lean**

05

**- A Case
Study**

Manufacturers are always looking for ways to improve the quality of their output, reduce costs, and achieve higher labor productivity. **Hardinge, Inc.**, has benefited through the use of these programs and has become an international leader in providing industrial technology to companies needing material cutting and grinding solutions.

Intelligent Sensors

07

A Report

In the light of forthcoming **Sensor-TEST Exhibition** at Nuremberg in May 2007, we are presenting an article on the role of Sensor management systems, to reduce down times and increase productivity.

TECH TRENDS

10

Organic nanowires for smaller solar cells talks about Irish Researchers find that photoconductivity in a single polymer nanowire, could lead to **inexpensive miniaturised solar cells** and photo detectors. Also, customers will soon be able to **pay** for goods and services simply **by waving their mobile phone at a contactless payment terminal**. Thirdly, researchers at TWI, the joining technology specialist, have adapted a versatile welding method to make what it claims to be some of the smallest welds in the world. The technique is **friction-stir welding**.

INDIA NOTES	Page 01
CORP CLIPS	Page 09
VARIETY	Page 11
BOOKS	Page 12

INDIA NOTES

Economic Indicators

The Government said the **rise in inflation to 5.16 per cent** for the week ended September 30, will not put pressure on interest rates as there is **ample liquidity in the economy**. "Inflation will hover between 4-5 per cent if supply side constraint persists," Finance Minister P Chidambaram told reporters. The government's intention is to bring down inflation below 4 per cent the Finance Minister had said earlier.

Pegging a massive resource requirement of **363 billion dollars over the next five years for development of infrastructure in India**, the Finance Minister invited private sector to pitch in with the support of the government in this crucial area for ensuring over 8 per cent growth in economy. "Economy is expected to grow at 8 per cent or more in the 11th plan. Unless investment grows at the same pace, it will not be possible to sustain the economic growth," he said addressing the **day-long summit on infrastructure** convened by the **Planning Commission**.

He said in the 10th Five Year Plan Rs 11 lakh crore investments were required to be invested in **infrastructure** and by 2012 Rs 2,20,000 crore needed to be invested in **national highways**, Rs 40,000 crore on **airports** and Rs 50,000 crore in **ports**.

August **industrial growth has declined** by 270 basis points as compared to the previous month, on account of a marginal decline in mining output and a deceleration in electricity output growth. The decline in growth rates has raised hopes that the RBI may decide to keep interest rates steady at its meeting by the end of this month.

Index of Industrial Production (IIP) for the month of August 2006 has increased 9.7 per cent from the same month of previous year, according to quick estimates released by the **Central Statistical Organisation**. Though industrial growth for the month is lower than 12.4 per cent reported for July 2006, it is better than 7.6 per cent achieved for the same month of previous year.

Industrial growth for the first 5 months of the current financial year remains at 10.6 per cent, 190 basis points higher than 8.7 per cent achieved for the same period of previous year.

Manufacturing continues to drive the growth, with output expanding 11.1 per cent after the scorching growth of 13.3 per cent during the previous month. Manufacturing growth was at a lower 8.5 per cent during August 2005. For the first 5 months of current year the sector has clocked a growth rate of 11.8 per cent as against 9.6 per cent for the same period of previous year.

India's forex reserves came down by \$30 million to stand at \$165.275 billion during the week ended October 13 as against \$165.305 billion during the week ended October 6.

Trade & Investment Agreement with EU



Giving a major push to their strategic partnership, India and the 25-nation European Union (EU) decided to sign a Trade and Investment Agreement, a comprehensive pact that will cover a vast spectrum of sectors. The **India-EU Summit**, attended by Prime Minister Manmohan Singh, decided to launch negotiations on the agreement, accepting a report of the High-Level Group of businessmen set up last year.

Prime Minister Manmohan Singh invited European companies to explore "expanded opportunities" in the Special Economic Zones (SEZs) being created in India.

Addressing the India-EU Summit here, he strongly disapproved of restrictive visa regimes, saying these can "stifle" the potential of business and trade cooperation between the two sides.

Singh assured that the interests of foreign companies with regard to further liberalisation of foreign direct investment in areas like telecommunication and retail, improvement of infrastructure, opening up India's financial sector and relaxation of labour laws was receiving the attention of his government.

Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR) in Bangalore

The government will set up of an international nano centre for material sciences at the Jawaharlal Nehru Centre for Advanced Scientific Research (JNCASR), union minister for science and technology Kapil Sibal said during the launch of **the country's first nano-lab**. JNCASR is situated at Jakkur, on the outskirts of Bangalore city.

"The nano-lab will focus on energy, India's prime requirement, especially **super-capacitors and nano-structures for sensors and photovoltaic cells**," he said.

He said the department of science and technology (DST) is planning to increase collaboration with JNCASR. The government, Sibal said, is also contemplating public-private partnerships in research on photovoltaic cells.

The government has planned investments to the tune of Rs1,000 crore in nano science and nano technology over the next five years. Of this, Rs180 crore would be spent during the current fiscal to set up around **seven to eight such facilities across the country**.

Sibal said the proposed international nano-science centre would also be **open to NRI scientists and technologists for pursuing research**. The centre would also provide for research collaboration with various other institutes for developing nano products.

IIFE NEWS**JHARKHAND CHAPTER**

National Symposium on Lean manufacturing was organised by **I I P E Jharkhand Chapter, Ranchi** in association with **Jharkhand Industries Association** and **the Industry Institute Interface, BIT, Ranchi**.

The symposium was a grand success measured by any standards. To judge the success of any symposium or program, usually the following three criteria are important:

1. Content
2. Faculty and
3. Delegates

All the three factors were very well planned.

The contents were very judiciously selected. The symposium was covered over 4 technical sessions over two days and engulfed the entire field of Lean Manufacturing.



Twenty Faculty members representing Industry and Academics from India and abroad, participated. Major Industries and Institutes represented were

- Tata Steel, Bearings Divn, Jamshedpur
- Indian School of Mines, Dhanbad
- Bihar Sponge Iron Ltd
- BHU Varanasi
- BIT Ranchi
- NIT Jamshedpur
- Motilal Nehru national Institute of Technology
- ASME USA etc.

The Symposium was well attended by about 100 people.

Immediate Past national Chairman IIFE, Shri O P Khanna was invited to give the key note address. He was also the chief guest at the Valedictory function. Shri Khanna also took the opportunity:

- **to make a power point presentation on IIFE Activities to the participants**

- **to visit the Jharkhand Industries Association and speak to the members as how IIFE could help them**
- **to attend a meeting of the IIFE Jharkhand chapter**
- **to attend the Industry University meet to finalise the Curriculum of BE & ME programs on "Competitive Manufacturing Strategy" Proposed to be introduced at BIT Ranchi**

IIFE Jharkhand Chapter is prepared to conduct similar programs in Bangalore and Pune.

NHQ Executive Committee meets

The NHQ-EC met on the 7th October 2006 at HMT corporate office in Bangalore, to take stock of the progress on its commitments to the General Body. The meeting was presided over by **IIFE National Chairman, Shri M.S.Zahed**.

As a first step towards regrouping the Chapters State-wise (in lieu of Region-wise) for effective administration, and expansion, Shri Zahed invited a special guest to this meeting, **Shri S.K.Sharma** from Pinjore, to take the lead in starting an **IIFE Chapter in Chandigarh**. Shri Sharma heads the Tractors Division of HMT, and he gracefully accepted this invitation. This step will spearhead the growth of IIFE in the States of **Punjab, Haryana and Himachal Pradesh**.

Another radical idea proposed by our Chairman, **needs serious consideration by all IIFE Chapters**. Instead of NHQ wasting time over monitoring the tiny details of Chapter accounts, Why not levy an **Annual Affiliation Fee** on Chapters, payable to NHQ? This way, NHQ budgets will become predictable, and the Chapters will have their freedom for their activities. It is likely that some chapters may even become richer than the NHQ!

Of course, the fee has to be based on factors like number of members, location, and types of programmes of each Chapter. Senior members of IIFE, please put on your thinking caps, and come up with your suggestions. **Shri B.G.Kemshetti**, has been given the responsibility to prepare a white paper on this suggestion. Send in your views to him at **bgkm@hotmail.com**

The Committee decided on sending delegations of our members to **Chicago Machine tool Expo** and **Nuremberg Sensor Show** in mid-2007. **Shri O.P.Khanna** Chairman for **International Networking**, agreed to start the ball rolling immediately. All Chapters will receive notifications in this regard in due course, well in advance.

Actions are already on for identifying a full time Executive for NHQ administration, and for suitable premises to house the NHQ office. Many promises have been made and broken with regard to reactivating our website. Secretary has assured that it shall be done for sure, this time, before end October 2006. So, watch out, and give us a feedback.

WELCOME TO NEW MEMBERS

W	LM	1158	Padmaker J.Pawar	K.K.Wagh College , Nashik
W	LM	1159	Sachin A.Patil	K.K.Wagh College , Nashik
W	LM	1160	Nanasaheb B. Gurule	K.K.Wagh College , Nashik
W	A	1161	Amol W. Bagesar	K.K.Wagh College , Nashik
W	A	1162	Amol S.Kamble	K.K.Wagh College , Nashik
W	A	1163	Santhosh S. Endait	K.K.Wagh College , Nashik
W	LF	1164	Surendra B. Chandorkar	Consultant, PUNE
W	F	1165	Rajendra V. Deshmukh	V.I.T. PUNE
W	F	1166	Arun P.Toraskar	Premier Ltd., PUNE
W	A	1167	Varun Arora	SEEI.Pvt.Ltd.,Gurgaon
W	A	1168	Shankar B.Jagadale	AtlasCopecp Ltd.,PUNE
W	A	1169	Nitin S. Mane	Keihin Fie Pvt.Ltd., PUNE
W	M	1170	Ajit S.Chitale	Keihin Fie Pvt.Ltd., PUNE
W	M	1171	Mandur B.Kulkarni	Keihin Fie Pvt.Ltd.,PUNE
W	M	1172	Kishor K. Zope	Keihin Fie Pvt.Ltd.,PUNE
W	M	1173	Manoj R. Kulkarni	Keihin Fie Pvt Ltd., PUNE
N	M	146	Major Decochakke K.S.	GE (1)AF LEH C/o 56 APO , LEH
S	OE	2966	Dr.B.G.Sangameshwara	Principal, SJ Coll. of Engg.,MYSORE
S	OE	2966	Dr.K.V. Sreenivasa Prasad	Asst.Prof.Dept.of I&P, SJCE, MYSORE
S	OE	2966	V.Ramesh	Asst.Prof.Dept.of I&P, SJCE, MYSORE
S	S	2967	Swaroop R. Kokanay	SJCE, MYSORE
S	S	2968	Datta Gowri Skanda Ratnam	SJCE, MYSORE
S	S	2969	N.Eshwari	SJCE, MYSORE
S	S	2970	Divya.Y	SJCE, MYSORE
S	S	2971	Kaleel Ullah	SJCE, MYSORE
S	S	2972	Laxshman N.P.	SJCE, MYSORE
S	S	2973	Abhishek M.R.	SJCE, MYSORE
S	S	2974	Mithun B.S.	SJCE, MYSORE
S	S	2975	S.Parashiva Murthy	SJCE, MYSORE
S	S	2976	Rakesh. R	SJCE, MYSORE
S	S	2977	Shruthi. B	SJCE, MYSORE
S	S	2978	Shruthi. V	SJCE, MYSORE
S	S	2979	Srikanth T. N.	SJCE, MYSORE
S	S	2980	Sukanya. V	SJCE, MYSORE
S	S	2981	Swamy. S	SJCE, MYSORE
S	S	2982	Sneha Pandey	SJCE, MYSORE
S	S	2983	Vashanthi. C.S	SJCE, MYSORE

S	S	2984	Somashankar Pujari	SJCE, MYSORE
S	S	2985	Vikas. H.V	SJCE, MYSORE
S	S	2986	Vikram Singh. G	SJCE, MYSORE
S	S	2987	Mamatha	SJCE, MYSORE
S	S	2988	Shruthi. R	SJCE, MYSORE
S	S	2989	Ajesh Jain	SJCE, MYSORE
S	S	2990	Ananda Hegde	SJCE, MYSORE
S	S	2991	Amitha. G	SJCE, MYSORE
S	S	2992	Deepthi. R	SJCE, MYSORE
S	S	2993	Guru Prasad. M	SJCE, MYSORE
S	S	2994	Latha. S	SJCE, MYSORE
S	S	2995	Manish. S	SJCE, MYSORE
S	S	2996	Nagarathna. J.H	SJCE, MYSORE
S	S	2997	Neetha. K	SJCE, MYSORE
S	S	2998	Santhosh Kumar. J	SJCE, MYSORE
S	S	2999	Shilpa. G	SJCE, MYSORE
S	S	3000	Shilpa. N.C	SJCE, MYSORE
S	S	3001	Shiva Kumar	SJCE, MYSORE
S	S	3002	Shubha. G	SJCE, MYSORE
S	S	3003	Vijay Ganesh. S	SJCE, MYSORE
S	S	3004	Vikas. R	SJCE, MYSORE
S	S	3005	Rajesh Jacob	SJCE, MYSORE
S	S	3006	Ranjit Menon	SJCE, MYSORE
S	S	3007	Arpitha. M.R	SJCE, MYSORE
S	S	3008	Rakesh Ramachandra	SJCE, MYSORE
S	S	3009	Srivalli. B	SJCE, MYSORE
S	S	3010	Savin B Subramani	SJCE, MYSORE
S	S	3011	Santhosh. S	SJCE, MYSORE
S	S	3012	Santosh	SJCE, MYSORE
S	S	3013	Sridhar. D.R	SJCE, MYSORE
S	S	3014	Nandishamurthy	SJCE, MYSORE

PUNE ANNUAL GET-TOGETHER

On 19th of December, there will be a family Get-together of I.I.P.E. Members and well-wishers, at **7.00 p.m.**, at **Hotel Mahabaleshwar on Baner Road**.

For those who don't know, the programme is like this - 7 o'clock - people start coming. As they come, a cup of coffee is offered. After a while, when people have settled, got introduced to each other, etc., an Entertainment Programme starts. Only talents from members and their families are exhibited, and this programme is always a great success. Around 9.30, we start dinner. With ice cream / coffee, the programme ends. People start going home, because they HAVE to go, actually nobody wants to get away from that friendly and enjoyable atmosphere.

A special feature will be that the **IIFE Chairman Shri M.S. Zahed** (CMD of HMT Group) will be attending the get-together, along with a couple of others from Bangalore specifically to witness this fellowship. All are welcome. **Please confirm your participation soon,**

CASE STUDY

Best Practices: Path of Continuous Improvement

Hardinge Inc. is an OEM of machine tools, with revenues of \$250 million. Located in Upstate New York the company has manufacturing and sales offices in several countries around the world.

Inc., is one company that has benefited through the use of these programs and has become an international leader in providing industrial technology to companies needing material cutting and grinding solutions.

Founded in 1890, this \$200 million company, based in Elmira, New York, designs and manufactures CNC lathes, machining centers, grinding machines and one of the world's largest lines of workholding products. Growth through product and geographical expansion has afforded a long history of profitability for Hardinge. Acquisitions over the last decade include: Kellenberger, Switzerland; HIT (Hauser, Tripet, Tschudin), Switzerland; and Bridgeport, USA. Other manufacturing locations include Hardinge Taiwan Precision Machinery, Ltd., a majority owned partnership, and Hardinge Shanghai Company, Ltd.

For the past two years, Hardinge has also been offering contract manufacturing services to companies within a 100-mile radius of Elmira. According to Dave Bassett, Corporate Lean Manager Manufacturing Engineer, "We have capacity that is open at the company and we're trying to sell that capacity. Years ago we manufactured everything here and were vertically integrated. The globalization of the economy has caused us to revisit that strategy and purchase parts competitively at a lot less cost than we can manufacture them in Elmira." That has opened up capacity that Hardinge can now market.

When Hardinge started business, they primarily manufactured lathes and workholding tools. Since venturing out as a widely diversified manufacturer, Lean Manufacturing has played a key role in their financial and throughput success. Lean continuous improvement started approximately three years ago and was driven from the top down. CEO Pat Ervin has driven not only Lean, but Six Sigma, Kaizen, and Machine Cycle Time initiatives. Ervin brought onboard Doug Rich, VP North American Lathe Operations, because of his vast knowledge and work experience of Lean Manufacturing. Doug also mentored Dave Bassett, and their teamwork has played a key role in elevating Hardinge to the forefront of manufacturing excellence. Although Pat Ervin might not pull the strings on a day-to-day basis on continuous improvement programs, he is one of the most passionate people in the organization when it comes to the benefits of lean.

Manufacturers are always looking for ways to improve the quality of their output, reduce costs, and achieve higher labor productivity. Many embrace programs such as Six Sigma, Lean Manufacturing, Kaizen, TPM, and others to stay competitive and gain a global advantage in the machine tool business. **Hardinge,**

and has become an international leader in providing industrial technology to companies needing material cutting and grinding solutions.

within a 100-mile radius of Elmira. According to Dave Bassett, Corporate Lean Manager Manufacturing Engineer, "We have capacity that is open at the company and we're trying to sell that capacity. Years ago we manufactured everything here and were vertically integrated. The globalization of the economy has caused us to revisit that strategy and purchase parts competitively at a lot less cost than we can manufacture them in Elmira." That has opened up capacity that Hardinge can now market.

When Hardinge started business, they primarily manufactured lathes and workholding tools. Since venturing out as a widely diversified manufacturer, Lean Manufacturing has played a key role in their financial and throughput success. Lean continuous improvement started approximately three years ago and was driven from the top down. CEO Pat Ervin has driven not only Lean, but Six Sigma, Kaizen, and Machine Cycle Time initiatives. Ervin brought onboard Doug Rich, VP North American Lathe Operations, because of his vast knowledge and work experience of Lean Manufacturing. Doug also mentored Dave Bassett, and their teamwork has played a key role in elevating Hardinge to the forefront of manufacturing excellence. Although Pat Ervin might not pull the strings on a day-to-day basis on continuous improvement programs, he is one of the most passionate people in the organization when it comes to the benefits of lean.

One of the programs to grow out of Lean was **Manufacturing Cycle Time (MCT)**. It has resulted in significant gains in how fast a product is manufactured at Hardinge. By definition, MCT is simply the time it takes a product to go from Point A to Point B. Prior to implementation of lean tools, it took 35 to 37 days to get one spindle through the value stream. By implementing a Kaizen event, which effectively looks at various processes with the value stream, it now takes just 10 days to manufacture five to seven spindles.

Dave Bassett, Corporate Lean Manager Manufacturing Engineer and Tom Doud, Advertising Manager, discuss the company's wide range of services in a showroom area of the plant.

With training of personnel through Demand Flow Technology (DFT) and final assembly redesigned, the whole matrix of the process resulted in a 47% reduction in lost time accidents, 268% reduction in Quest line MCT, and 170% reduction in Elite line MCT. DFT also resulted in maximized throughput and helped eliminated non-valued added process time.

How did Kaizen enter into reducing cycle times? According to Bassett, it started with a pareto analysis of the various part costs. High on the list was the cost of the spindle, one of largest drives in machine tools.

"It made sense to focus on a Kaizen effort on this particular component," says Bassett, "and get a cross functional team together of engineering, design, process, assembly, manufacturing engineering, operators, management and service people to do value-stream analysis of the process." "When they did, they looked at current and future states, a process that only took five days. The team defined goals as well as an ROI for the project and came up with a complete redesign of the process on paper. When the plan was put into motion over the course of several months, it involved moving machines and redesigning a product machining cell. As a result, the process flow initially occupied some 3,400 feet through the shop now extends only 1,000 feet.

Kaizen brought the process to a focus in the middle of the plant, saving floor space that will be turned into cells for different parts of the machine. With specific cells for different parts on the machines, Hardinge was able to save and eliminate inventory draw through Supplier Owned and Managed Inventory (SOMI). Rather than use one location in the plant for parts, which had required excessive time for workers to travel back-and-forth, specific areas are now dedicated to manufacturing cells. Key vendors maintain and re-supply the areas, helping make better use of plant personnel.

A key to set-up reduction is organized tooling and fixtures. This rack is set up using a matrix format that is linked to an alphanumeric index.

Another example involves the largest single purchase item for machine tools - controls. Hardinge has developed a relationship with Fanuc, who has established a local "express warehouse." Fanuc maintains the inventory but does not get paid until a control is called for, saving plant storage space and getting delivery on a JIT basis.

Six Sigma has also been a key factor in Hardinge's success. Currently in-house there are six trained "Black Belts", four in manufacturing and two in the Work Holding division. One of the four in manufacturing is dedicated

full-time to Six Sigma to help identify waste. Although Six Sigma is not designed to eliminate anything, it is a powerful data-driven analysis tool that helps identify waste areas, which can then be attacked using one of the many lean tools.

"One of the things we are working on now has nothing to do with the actual manufacturing process," says Bassett. "It is the cost of shipping materials in and out of the company. Do we use disposable containers? Do we send materials using next day service or use ground service? If we get a reusable container and send it back, are we only charged once? There is the potential to save millions of dollars a year in just shipping costs. Even though it is disconnected from manufacturing," he says, "it can have a huge impact on the overall organization's bottom line. The key to continuous improvement lies with the application of Six Sigma analysis tools in conjunction with lean tools to identify and eliminate waste."

Even though there are a few areas where Lean/Six Sigma has not worked, any continuous improvement plan requires current state, mid-term goals and long range objectives, says Bassett. If you analyze why you didn't reach your goals, that could be the next area to attack and where to apply Six Sigma and Lean," he says. "Failure is not as important as understanding why it failed.

Point of use supply points have dramatically improved the company's control of inventory.

"One of the areas that previously failed was in HLV assembly. "The first time I did it in DFT, with process synchronization, process map, and material flow, it worked on CAD but not when the process was put in place," says Bassett. "It is important to understand why it didn't work. What I realized when I looked at the problem again is I didn't get the right people on the floor as involved as I should have. Questioning them brought out this fact. The next time Bassett did the whole process over and made sure he got everyone involved. That assembly line now works truly on a demand-flow basis, processing parts to fulfill customer requirements only. If all IPK's (In-Process Kanbans) are full, the operators rotate to another area. If an IPK is empty, the operators will work to fill this requirement. "To realize that I failed the first time and evaluate why there was a failure was the key," says Bassett. "I was able to develop the best example of a true DFT line in the plant."

An innovative area that links directly to Lean/Six Sigma has been Hardinge Toolbox meetings. These allow lean management model production, quality, production, safety and human resources to combine into customer service. The meetings concentrate on these important aspects of business, not from a standpoint of immediately solving the problem, but by documenting it on a defect card. If a person has a waste or defect idea or something that stops them from doing their job, their ideas are put on a board and assigned to different areas within the organization for resolution. Since a lot can be solved within the team, different personalities and strength of leadership play a key part of solving problems that make life easier and lead to elimination of waste.

Although there has been some resistance from workers, Bassett admits communication has not been what it should have been. Key to the program is communicating in the right way - explaining why lean is important and what it will do for workers - as well as trying to get valuable feedback so workers will buy into the program.

"After they have bought into it and see the results," says Bassett, "there has been a dramatic reduction in employee resistance. That is what communications are doing for us."

Hardinge finds that employee involvement is a key to the successful integration of the principles of DFT and continuous improvement initiatives.

From a financial and throughput aspect, Lean has made a big difference at the company. Though it was begun in 2002, lean has not caused anyone to lose their job, but rather, it has kept jobs in place and created additional business opportunities. By encompassing the whole organization and being driven from the top down, the concepts of lean manufacturing are transformed into a lean enterprise. Workers implement strategies using the tools of DFT and look at the process. They will define the process and re-define it after taking out all non-value added steps. By using temporary help and people off the shop floor when times are slow, the workforce starts to implement things that have been laid out on a road map. Lean managers can then step back and make sure everyone is within guidelines. This huge team effort has spread a unique culture at Hardinge that benefits the entire organization.

The Control Room is another new business strategy at the company. "One of the things we realized we were lacking was communications among sales, planning and the shop," says Bassett. "It was not a good link from a business standpoint, since all the players were all over the place. We did some best practices studies of who is best at multi-tasking," he says, "and NASA, a nuclear sub, and power plants quickly surfaced as those who have capitalized on the concepts of a close-nit communications apparatus. A power plant, for example, has a control room because all the key functions to run it are right there in one area - all critical decisions can be made without hesitation. When we looked at that concept it really made sense. Who are the key players in the organization? Planners, internal sales, manufacturing and engineering. If you put all these people in one room and link them with visual displays and real-time measurements, you have the heartbeat of the company. This will be a key driver in the ability for the manufacturing organization to compete in the market today."

Borrowing a page from Henry Ford, Hardinge has instituted point of use inventory, flow lines and standard work to maximize its production potential.

After identifying a location, finding and relocating all the right people and connecting to the IT system, the Control Room has become the latest business innovation at Hardinge. Now, when an order is received and hits the shop floor, the Control Room will get instantaneous feedback and communications that Hardinge didn't have in the past.

"If you cut out all the red tape, non-value added time, lost paperwork, and everything else, you have all the information in front of the right people," says Bassett. He sees the Control Room as one of the company's most important lean initiatives, and one that will extend the company's already impressive continuous-improvement efforts. "It now takes 10 days to assemble a Quest machine and an HLX takes about an hour," says Bassett. "Five years ago we could not do that," he adds. "Today we can."

Hardinge Inc., One Hardinge Drive, Elmira, NY 14903, USA.

SPECIAL REPORT**Intelligent Sensor Management Systems:
Information For Efficiency****By Eric Kirleis, Mettler-Toledo Ingold**

The marketplace is full of **instrumentation advances** that are either **smart** or **intelligent**. Smart sensors store information, and intelligent sensor management systems use the information in an adaptive way. The new focus of these instruments is **not so much on detection technology but on communication, interrogation and performance-status features**. This is a result of the fact that process analytics companies are driven by their customers' demands for additional information. It's the impetus of these demands and how an intelligent sensor management system meets them that the process engineer, plant manager and maintenance group members need to understand.

The main challenge faced by today's process industries is to remain globally competitive. To do this, **a firm must not only establish a competitive core competency in a given product area, but it also must continually improve their processes** in order to retain that competency. This means maximizing quality throughput and minimizing cost with the existing plant infrastructure. This often causes situations where a 30-year-old plant, for example, competes globally with a 2-year-old plant. The findings of a 2004 ARC Advisory Group report show that **in the U.S. alone, \$20 billion per year is lost to unscheduled industrial plant downtime, with one-third that amount attributed to equipment failure**. The same report suggests that 25 percent of a plant's overall maintenance budget is dedicated to maintaining field instruments.



Thus, the impetus from process industry plant engineers and plant managers on process analytic companies is clear. They need more useful information in order to make better decisions.

They want to proactively manage their processes to make their product more efficiently. This is compounded by the general notion that they need to do more with less.

According to the ARC report, a "loop" or a measurement point such as pH can cost a plant up to four times the initial acquisition cost over its lifetime. Costs driving this include maintenance, consumables and downtime. In some industries, downtime can mean millions of dollars of product that has been delayed, is out of specification or lost altogether. **Maintenance and consumable costs are a self-fulfilling problem** in that the very presence of the equipment and the fear of downtime justify having high maintenance budgets and elaborate schedules to "monitor" equipment.

An intelligent sensor management system can alleviate this situation, provided it has the following:

- **Ease of operation:** Workers must be able to understand the instrument System. Complexity to implement may not be used.
- **Safe operation:** To ensure process safety, an intelligent system can permit use only of a specific authorized sensor type. For personal safety, exposure to hazards can be minimized by using pre-calibrated, self-configuring sensors.
- **Self-configuring:** This feature provides communication between transmitter and sensor, including connectivity status, sensor identification and calibration information. A smart sensor allows access to this information upon request, while the intelligent sensor management system displays the information at connection.
- **Self-assessment and advanced diagnostics:** Using pH measurement as an example, these instruments are capable of monitoring sensor slope, zero point, reference impedance, glass impedance and response-time monitoring. Also, intelligent sensor management systems monitor operating time, process temperature and chemical concentration exposure. They use all the above information in an adaptive manner to establish sensor wear and automatically adjust calibration timing. Smart sensors are historic, and intelligent sensor management systems are predictive and adaptive.

Intelligent sensor management systems should also be expandable and compatible with industry standards. This means they must utilize an open communication protocol such as IEEE 1451.4 and use a widely acceptable connection system such as VarioPin connectors. The last thing you want to do is lock your plant into a proprietary installation.

Intelligent sensor management systems yield benefits at many organizational levels. For example, the maintenance group can install a factory-calibrated sensor "out of the box." Further calibrations can be done in a controlled laboratory environment and automatically downloaded in the field. Frequent "just-in-case" calibrations can be replaced by timely "as-needed" calibration. Sensors are discarded only when the empirical "sensor wear" indicator says they should be discarded. Furthermore, an aging electrode can be removed prior to a critical process event. Process engineers benefit from automatic transmitter configuration of sensor settings, quick troubleshooting ability, continuous reference check in the case of pH and the recording of peak sensor temperature.

Intelligent sensor management systems mean **higher productivity and less downtime due to quick setup, troubleshooting capabilities and adaptive sensor diagnostics**. They can provide better operational safety due to the "plug-and-measure" concept, electronic documentation and audit trail links, which result in lower overall operational costs and better profit margins.

www.lean.org

LEAN ENTERPRISE INSTITUTE**De-Mystify the Lean Transformation!**

The Lean Enterprise Institute's practical, plain-language books and workbooks answer the question many of you have about how to implement lean principles, "What concrete steps do I take on Monday morning?"

Learn more

Click the tabs above to access the following resources for lean manufacturing and applying lean principles in administrative, professional, service, and transactional activities:

Store - Find books, workbooks, and training materials to support your lean transformation.

Training - Learn when our practical, plain-language workshops for implementing lean principles in manufacturing and non-manufacturing environments are coming to your region.

Summits - Explore new frontiers in Lean Thinking at conferences in the U.S. and at our global affiliates.

Library - Help yourself to valuable information from lean experts -- LEI's authors. Discover complementary content to LEI books and workbooks, such as Q&A with the authors, glossaries, and excerpts.

Community - You're not alone.

Ask questions of other Lean Community members in the Forums or connect with other Lean Thinkers through Links and our growing Global Network. Read original Success Stories by LEI or Articles about lean transformations by the business media. Examine e-letters from Jim Womack and Dan Jones, download presentations and value-stream mapping icons, and much more. (Access is free with a simple one-time sign-up. Member information is never sold, shared, or swapped.)

Who We Are - Learn about our mission as a nonprofit, find out how to contact us, and meet our faculty and staff members in the U.S. and around the world.

The **Media Center** is designed to give members of the media quick access to background articles about lean manufacturing, definitions of key lean principles, and news releases with information about our lean training, books, and workbooks.

Jim Womack's Greeting History

Search lean.org advanced search

[Product Catalog](#)
[Lean Workbooks](#)
[Lean Leadership](#)
[Lean Applications](#)
[Lean Tools](#)
[Lean Fundamentals](#)
[Registration Information](#)
[Lean Road Map](#)
[Register for Lean Training](#)
[Lean Transformation Summit](#)
[Creating Continuous Flow](#)
[Forums Archives Links](#)
[Global Network](#)

**Home****Lean News & Updates****Plan Ahead for Training**

Registration is open now for regional workshops in CT (Oct.), CA (Nov.), FL (Dec.), and TX (Jan.). Get course content and exact dates.

Seats Available

Our Northeast regional training features workshops for beginning and more advance lean thinkers including:

- Key Concepts of Lean, Oct. 18
- Lean Accounting, Oct. 19

New Content

- Mapping when operator time varies
- From push to pull
- Manufacturing
- Low Volume/High Variety
- Beyond the Factory
- Healthcare
- Lean Accounting

Summit on Lean Enterprises

Save the dates: 28 Feb.-1 March, 2007, for the Lean Transformation Summit, Atlanta. Hear practical case studies on creating a lean enterprise. More.

Member Sign-up

Our twice-monthly e-letters deliver insights about lean thinking from Jim Womack and alerts on new web content. Using the Home tab drop-down menu, log in and check "Allow E-letters" near the bottom of the form.

> **Member Login**
 > **Member Signup**

CORPORATE CLIPS**Moser Baer India acquires US-based firm**

Moser Baer Photo Voltaic Ltd (MBPV), a wholly owned subsidiary of **Moser Baer India Ltd**, announced a strategic investment in the Palo Alto-based **SolFocus Inc**, a concentration photovoltaic (CPV) technology company.



This investment follows strategic equity participation in another solar concentrator technology

Company, **Solaria**, announced a fortnight back. Moser Baer India has invested Rs32 crore (\$7 million) in the final closing of SolFocus Series A funding.

These investments into **the first generation non-silicon based photovoltaic concentration technology** form an integral part of MBPV's strategy to develop a sustainable competitive edge and technological leadership in this high growth industry. The solar concentrator technology holds significant potential to expand the global market and applications which today are restricted due to the high cost of silicon based systems with respect to conventional energy.

Ravi Khanna, CEO, Moser Baer India, said, "This agreement represents a significant step for both SolFocus and MBPV towards commercialisation of CPV technology. Our strategy is to clearly straddle multiple future technologies and emerge as an engineering and technology driven company. We are decisively responding to the rapidly expanding solar PV market, where worldwide demand far outstrips supply."

The agreement also gives MBPV the exclusive distribution rights of SolFocus CPV panels in India and neighboring countries, which is estimated to be amongst the fastest growing regions for solar energy business.

Pilot production and field tests at MBPV are expected to begin in 2007, commercial production planned for 2008. SolFocus also has pilot production underway in Sunnyvale, California, where over 4,000 panels will be produced for extensive reliability and field testing.

Motorola plant to be operational in 2007

Motorola expects its manufacturing unit at Sriperumbudur, near Chennai, to go in to production by the first quarter of 2007.

Germany's Motorola, the world's second largest mobile phone company behind Sweden's Ericsson, is investing \$100 million in the unit, which would have a capacity to roll out one million handsets per month.

Speaking on the side lines of **MobileAsia exposition** Lloyd Mathias, director, marketing, Motorola India, said that the company's manufacturing unit would make all categories

of handsets and would have enough capacity to cater to the domestic market and exports to other parts of Asia. Motorola currently has a portfolio of 18 models.

Motorola's unit is coming up in the Tamil Nadu government promoted SEZ. Apart from the manufacturing unit, **Motorola has a development centre in India, which has been developing software for Motorola products worldwide employing 3,500 people**. This team would be used for customising products for the Indian market, Mathias disclosed.

Ceat puts up Sri Lanka's first radial plant

Sri Lanka's first radial tyre plant, put up in collaboration with Ceat Ltd was inaugurated by Sri Lanka's prime minister Ratnasiri Wickramanayake. The fully automated, temperature and humidity controlled plant is located at Kelaniya near the capital Colombo.



Setup with an initial capital of SLR 350 million, the high productivity plant will have an initial installed capacity of 26,000 tyres per month and catering both to the domestic and export market. The plant will initially focus on two

ranges of radials - for cars and vans, which are currently the most sought after sizes in the local market.

The technology imported for the new plant comprises state-of-the-art equipment for increased accuracy and productivity. **Each electro-pneumatic machine requires just one operator to input a sequence of commands and then motor process**. The fully air conditioned radial plant has also been designed with a focus on safety.

Built alongside the existing plant in Kelaniya, the radial plant will produce T-rated steel-belted radial tyres with high durability polyester carcasses and unique tread patterns designed for Sri Lankan roads. CEAT Sri Lankan venture already has a market share in excess of 50 per cent in the segments in which it operates. It also plans to export LCV and passenger car radials from the plant to the India, taking advantage of the FTA between India and Sri Lanka.

The unique features of the products to be rolled out of the new plant include **a centre rib that provides improved steering and handling capabilities, while the parallel 'see through' channels aid water removal**. Parabolic grooves in the tread pattern provide increased traction and better grip to prevent spinning and enhance braking, a requirement in keeping with local practice in Sri Lanka.

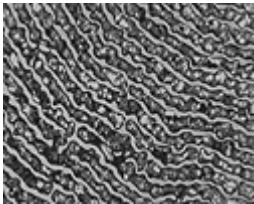
The company plans to increase its production capacity to 100,000 passenger car radials per month within six months of achieving an enhanced production capacity of 65,000 tyres. This increase in production coupled with free import norms from Sri Lanka will enable the company to gradually cater to the growing car tyre segment across South Asia.

TECH TRENDS

Organic nanowires for smaller solar cells

Irish researchers have measured **photoconductivity in a single polymer nanowire, a finding that could lead to inexpensive miniaturised solar cells and photo detectors.**

Both devices work by converting light into electricity, and building smaller versions of the devices will rely on nanostructured materials with good photoconducting properties. The properties of inorganic photoconducting nanowires, such as ZnO or Si, have been measured, but relatively little is known about the properties of organic nanowires. Organic nanowires could be both chemically tunable and relatively inexpensive to integrate into electronic circuits.



Gareth Redmond's group at the Tyndall National Institute in Cork, Ireland has succeeded in measuring photoconductivity in a single polymer nanowire. The researchers fabricated the 200nm wide, 15µm

long polymer wires using a simple template wetting technique. Metal contacts were made on either end of a single wire to measure the photo-induced current over several on-off cycles of a near-ultraviolet laser.

The wires' quantum efficiency, or the number of current-carrying electrons produced per photon hitting the wire, is about 0.1 per cent, which is comparable with several inorganic nanowires. As in many polymer-based electronic devices, the limiting factors may be the non-crystalline structure and poor electrical contact with the metal leads.

Wave to pay

A pilot project by payment handling company JCB could mean **customers will soon be able to pay for goods and services simply by waving their mobile phone at a contactless payment terminal.**



The Near Field Communication (NFC) mobile payment pilot project was launched in

Amsterdam with a number of partners including Nokia. Following initial trials in September, the pilot service is now being rolled out to a broader group of JCB's customers. The project marks Europe's first contactless international credit payment scheme using a mobile phone with an NFC chip.

Selected JCB cardholders are provided with a mobile phone by Nokia, which is **equipped with an NFC chip and loaded with the payment application.** At selected merchants, cardholders can securely purchase items by just holding their mobile phone close to a contactless NFC reader/writer.

NFC has already taken off in Japan, with 12.6m users of the wallet phone. Nokia said it plans to make NFC chips available in more phones.

Stirring stuff

Ultra-thin metal foils — used widely in everything from secure packaging for electronics to materials for satellites — are so lightweight and fragile that joining them together by lasers or flux-based welding methods is a problem.

In a bid to find a solution, researchers at TWI, the Cambridge joining technology specialist, have adapted a versatile welding method to make what it claims to be some of the smallest welds in the world. **The technique is friction-stir welding,** initially developed in the early 1990s for the aerospace industry. Although commonly used for fairly thick sheets of aluminium, copper, steel and titanium, the TWI team has now used it for sheets of aluminium around 300 microns thick.

'At the moment, these materials tend to be joined using phase-change methods — these involve melting the metal or a flux, changing it from a solid to a liquid, which takes quite a lot of energy,' said project leader Nee Joo Teh.



Friction stir welding, by contrast, does not melt the material, and is therefore low energy. 'The process uses no glues, chemicals or welding fillers, fluxes or wires,' he said. 'Environmentally, the process is a major breakthrough.'

A welding tube is rotated at high speed, and then brought into contact with the interface between the two sheets to be welded. The spinning tip heats up the interface zone through friction, softening the material on either side. As the tip moves along the join, the rotation literally stirs the material, leaving a joint in its wake. **'It just uses mechanical and friction forces, softening the material and removing any oxide layer,'** said Teh. The team has managed lap-welds and spot-welds in 0.3mm thick aluminium sheets, and butt welds in foils 0.5mm thick, with welding speeds of 100-500mm/min.

Miniaturising the process meant new designs for many of the components, said Teh. **'The key issue here is how to develop a process which is repeatable and highly controllable, and produce joints to meet the strength required for various applications.'** What goes into the process design is the speed of rotation, the design of the welding tube itself, the clamping of the workpiece on either side, and these are all interrelated.'

Other applications include sealing high-integrity protective foil packages for the electronics and photonics industries. There are also potential uses in the manufacture of medical devices, and in consumer goods and food packaging.

VARIETY

TOON CORNER



“We installed little monitors because they make all of our problems look smaller.”

TIME TO THINK

Can You Become Intoxicated by the Power of Suggestion?

By Dr. Stephen Juan

Mind over matter goes a long way. Reports of intoxication occurring merely through the power of suggestion and not through alcohol ingestion appear from time to time.

An early example of this is a 19th century incident in the US state of Maine. A logging camp was stocked with bottles of vanilla extract containing alcohol. Workers at the camp would occasionally break into the camp's stores, drink the vanilla extract, and become intoxicated.

Eventually, the logging camp managers changed to stocking bottles of vanilla extract not containing alcohol. The workers still occasionally broke into the stores, still drank the vanilla extract, and still got intoxicated - without alcohol!

Mind over matter can happen with non-alcoholic drinks too. "What you think may be as important as what you drink." This is according to Dr Andrew Scholey, a professor of psychopharmacology at the University of Northumbria in Newcastle in the UK.

Scholey reported to the British Psychological Society in 2000 on his study of the psychological effects upon drinkers of caffeinated and decaffeinated coffee. As everyone is told, caffeinated coffee (CC) makes you stay awake and keeps you more alert. Decaffeinated coffee (DC) supposedly does not.

Scholey and research colleagues conducted a simple experiment. They informed each subject in the experiment, all of whom were coffee drinkers, that each would be assigned to one of two groups (A or B). They informed subjects that those in A would be given CC, those in B would be given DC, each subject would then take a computerised test, and each subject would be told which group they were in (and what they were given).

In reality, without being informed, all subjects were divided into four groups (A1, A2, B1, B2). Those in A1 were told they were getting CC and were given CC. Those in A2 were told they were getting CC but were given DC. Those in B1 were told they were getting DC and were given DC. Those in B2 were told they were getting DC and were given CC.

The researchers found that, as predicted, subjects who drank CC were faster and more accurate on a computerized test - but only if they thought they had been given CC. Subjects who drank CC but thought it was DC performed less well.

Most interesting of all, subjects who thought they had drunk CC, but in reality had drunk DC, performed on the tests as if they had really had drunk CC. Thus, what you think is real can be more important than what is real. Mind over matter goes a long way.

TWIST IN THE TALE

The obedient wife

There was a man who had worked all of his life, had saved all of his money, and was a real miser when it came to his money. Just before he died, he said to his wife, "When I die, I want you to take all my money and put it in the casket with me. I want to take my money to the afterlife with me." And so he got his wife to promise him with all of her heart that when he died, she would put all of the money in the casket with him.

Well, he died, he was stretched out in the casket, his wife was sitting there in black, and her friend was sitting next to her. When they finished the ceremony and just before the undertakers got ready to close the casket, the wife said, "Wait just a minute!" She had a box with her. She came over with the box and put it in the casket. Then the undertakers locked the casket down, and they rolled it away.

So, her friend said, "Girl, I know you weren't fool enough to put all that money in there with your husband?"

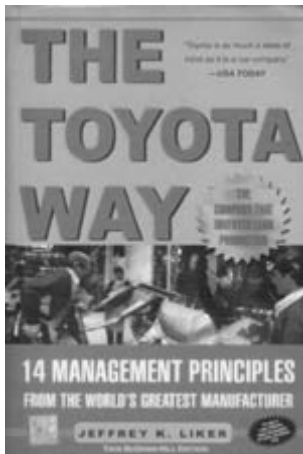
The loyal wife replied, "Listen, I'm a Christian, I can't go back on my word. I promised him that I was going to put that money in that casket with him."

"You mean to tell me you put that money in the casket with him!!!!?" exclaimed the friend.

"Sure did," said the wife. "I got it all together, put it into my account and wrote him a cheque. If he can cash it, he can spend it."

October '06 SU DO KU September '06

							1	5	9	8	6	2	3	4	7	1
7		6		3	1	5		6	7	1	4	5	8	2	3	9
	3		9	4	2		8	2	3	4	1	9	7	8	6	5
	6	4	7	2				8	4	9	2	7	1	3	5	6
5							3	1	6	2	3	4	5	9	8	7
				8	5	2	6	3	5	7	9	8	6	1	4	2
4			3	7	9		5	7	2	5	8	1	4	6	9	3
		3	6	5		1	4	4	1	6	5	3	9	7	2	8
6								9	8	3	7	6	2	5	1	4

BOOKS

**The Toyota Way –
14 Management
Principles**

ISBN – 0070587477

Publisher – Tata McGraw

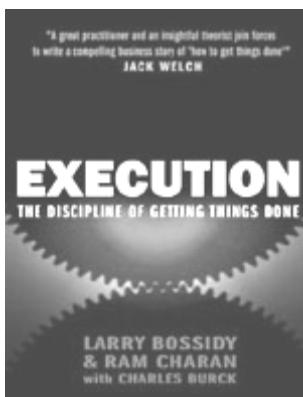
Price – Rs. 275

"With a market capitalization greater than the value of General Motors, Ford, and Chrysler combined, Toyota is also, (by far), the world's most profitable automaker. Toyota's well known 'secret weapon' is Lean production-the revolutionary approach to business processes that it invented in the 1950's and has spent decades perfecting. Less well known are the management principles that underlie Lean production, Lean product development, and all of Toyota's business and service processes. Today businesses around the world are attempting to implement Toyota's radical system for speeding up processes, reducing waste, and improving quality. But are they getting beneath

the surface of Lean tools and techniques to the real foundation of Toyota's success?

The Toyota Way, explains Toyota's unique approach to Lean management-the 14 principles that drive Toyota's quality and efficiency-obsessed culture. You'll gain valuable insights that can be applied to any organization and any business process, whether in

services or manufacturing. You'll discover how the right combination of long-term philosophy, processes, people, and problem solving can transform your organization into a Lean, learning enterprise-the Toyota Way. "



EXECUTION – The Discipline of Getting Things Done

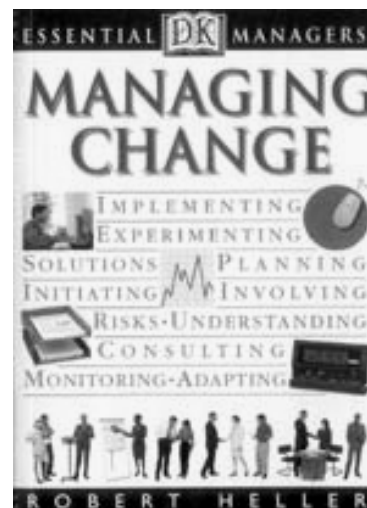
Publisher – Random House

ISBN – 0712625984

Price – Rs. 650

"Larry Bossidy is one of the world's most acclaimed CEOs, with a track record for delivering results that has few peers. Ram Charan is a legendary advisor to senior executives and boards of directors, with unparalleled insight into why some companies are successful and others are not. The result is *the book people in business need today*. One with a highly practical framework for closing the gap between results promised and results delivered.

After a long, stellar career with GE, Larry Bossidy become CEO of Allied Signal and transformed it into one of the world's most admired companies. Accomplishments like 31 consecutive quarters of earnings-per-share growth of 13% or more don't just happen. They result from consistent practice of the discipline of execution: understanding how to link the three core processes of any business together: people, strategy and operations. "



Managing Change

Publisher - DORLING KI

ISBN – 0751306339

Price – Rs, 290.55

Practical techniques show you how to initiate, anticipate and respond positively to change in order to become an efficient and flexible manager; clear text and illustrations cover every aspect of formal and informal management;

simple checklists enable you to be fully prepared throughout the management process; accessible charts and flow diagrams explore different options for action and provide useful examples.

Edited and Published by R. Chandrasekar on behalf of the Indian Institution of Production Engineers, 16, Park Road, Bangalore 560051, and Printed by P. Rangarajan, Director, Grafiprint (P) Ltd, at W.Q.Judge Press, 97, Residency Road, Bangalore 560025

To

IIFE MANUFACTURING NEWS

If undelivered return to -

Indian Institution of Production Engineers

16, Park Road, Tasker Town

Bangalore 560 051

RNI Regn. No. KARENG/2005/14740

Postal Regn. No KA/BGGPO/2509/05-06

Posted at GPO Bangalore, on the 25th of the issue month