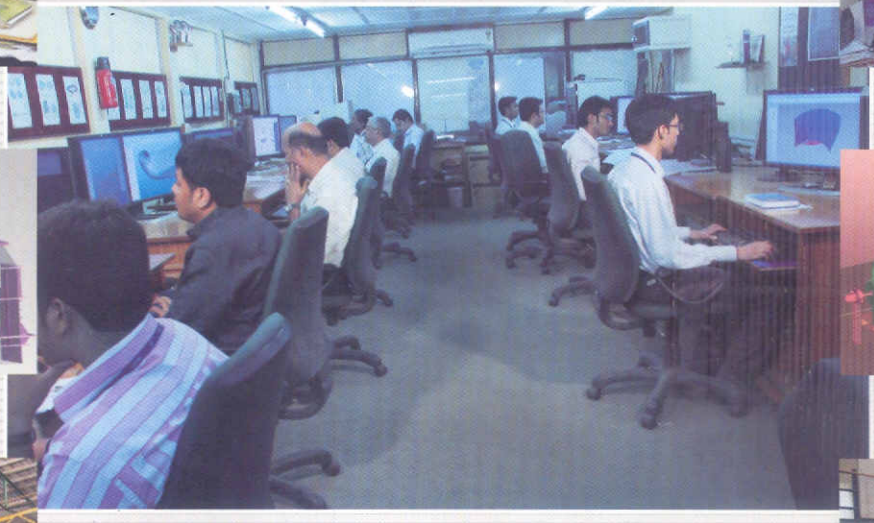
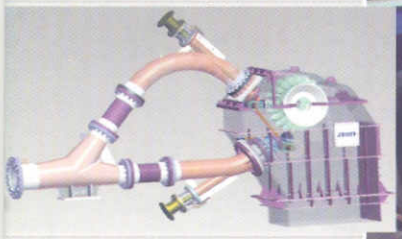
Jyoti Ltd.

Water • Power • Progress

'Jyoti' Technology Centre




Complete Product Development
in Virtual Environment

TUV NORD ISO 9001

65 YEARS OF ENGINEERING EXCELLENCE

VISION

Jyoti Ltd. shall be a leading engineering company with Global Perspective offering superior quality products and services for Water & Power sectors through reliable, economical and innovative turnkey solutions in water management, power generation, transmission and distribution areas.

MISSION

Jyoti Ltd. will endeavour to achieve its Vision by continually upgrading its core competence through a judicious mix of indigenous research & development, technology-imports, human resource development, promoting team spirit and entrepreneurship among its employees in order to achieve total customer satisfaction and add economic value to all stakeholders of the Company.

'Jyoti' Technology Centre : In Retrospect

In consonance with its basic philosophy of self-reliance, Jyoti has always endeavoured to develop technologies appropriate to Indian conditions. To achieve this, Jyoti established its own Research & Development Centre in 1964 (now known as Jyoti Technology Centre) where, through innovations, new products are developed and those already developed are continuously improved or upgraded. The development activities of the Technology Centre aim towards making available to its customers, products and systems of high quality conforming to Indian and International Standards.

The main objective of this Centre is to undertake market-oriented research which would result in development of products to meet the changing requirements of two core sectors of Water & Power which the Company serves.

For this purpose, the Centre

- undertakes complex and sophisticated design and development projects in the field of Electricals & Hydraulics.
- develops technical know-how, adapts and absorbs technologies to optimize designs and makes effective use of resources available and thereby improves the performance and quality of products on continuous basis.
- develops and assesses special materials for use in the products manufactured by the Company.

The first of its kind to be set up in private industrial Sector in 1964, the Centre :

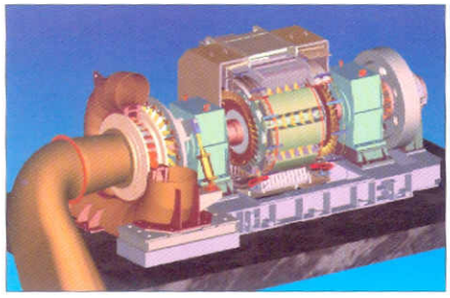
- is recognized by the Department of Scientific & Industrial Research (DSIR), Government of India for last 47 years.
- is equipped with state-of-the-art computer facilities for design,
- undertakes analysis & drawing preparation.
- has established laboratory-set-up for various product development & testing.
- has a Technical Information Centre (TIC) with wide coverage of Technical journals / books on technical subjects.

Responding to the needs of time

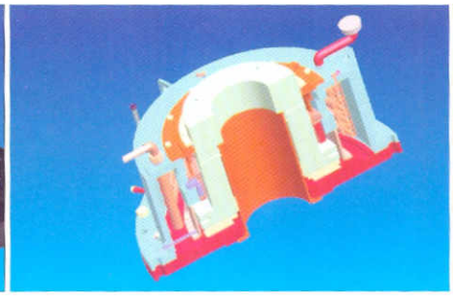
Jyoti Technology Centre aims at 'Virtual Development' through the use of specialized design techniques, analysis, and simulation software. Use of state-of-the-art technological tools have helped Jyoti to continuously upgrade products in terms of performance, quality, reliability and cost.

Jyoti's glowing success in the field of engineering and technology development is the result of due emphasis on design given at the Technology Centre, which is supported by over 80 experts from various functional areas alongwith the latest high-end Workstations (HP-Z800 & HP-Z400) which are used for engineering analysis and computer aided design.

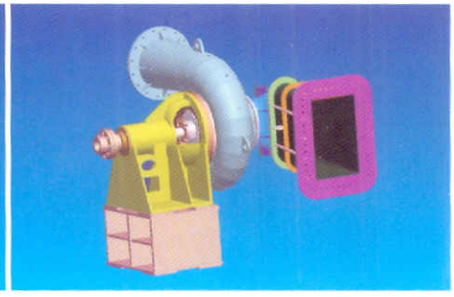
The first of its kind in the western region of the country, the centre aims at virtual engineering by providing CAD / CAM / CAE solutions to improve designs and manufacturing processes, enhance the product quality, reduce the cost and time to market.



Horizontal Francis Turbine Generator Set



Jyoti Hydro-Dynamic Titling Pad Vertical Bearing



Pump Model Test for KNNL

Objectives of Technology Centre : 3 'Ps'

Product Development through Technological Innovations

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Product Performance Enhancement

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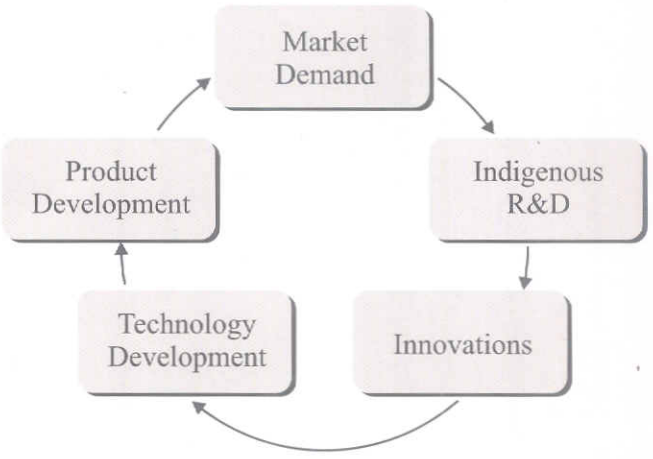
Productivity Improvement

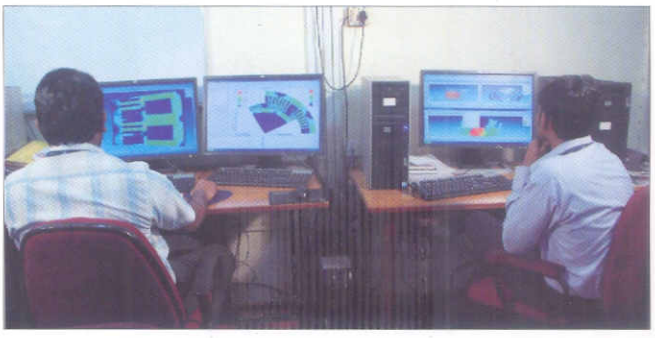
Product Development Cycle

At Jyoti, this originates from Market Demand and completes with Product Development to meet this market demand

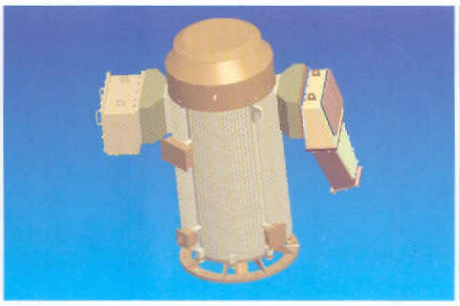


Product Development at Jyoti - A Chronicle

- In 1997, created a separate department-*Computer Aided Design* and *Computer Aided Engineering* for Product Development.
- Jyoti was 1st in Gujarat, to start work on 3D modeling and product development in virtual environment using software assets like *Pro/E, Mathcad, ANSYS (CFD, Mechanical, Maxwell, RMxprt), Autocad, Inventor, Catia, Solidwork, Unigraphics, Thermnet & Magnet.*
- In a span of 3 years, successfully established product design and modeling in virtual environment.
- In 2005, introduced **ANSYS (CFD)** and started work on engineering analysis and simulation for development of hydro turbines & pumps.
- In 2007, introduced **MagNet** for Electro-magnetic analysis.
- In 2010, introduced **ANSYS (Mechanical, Maxwell, RMxprt) & ThermNet**
- In a decade, Jyoti has successfully established complete product development in virtual environment.



Typical Horizontal Francis Turbine

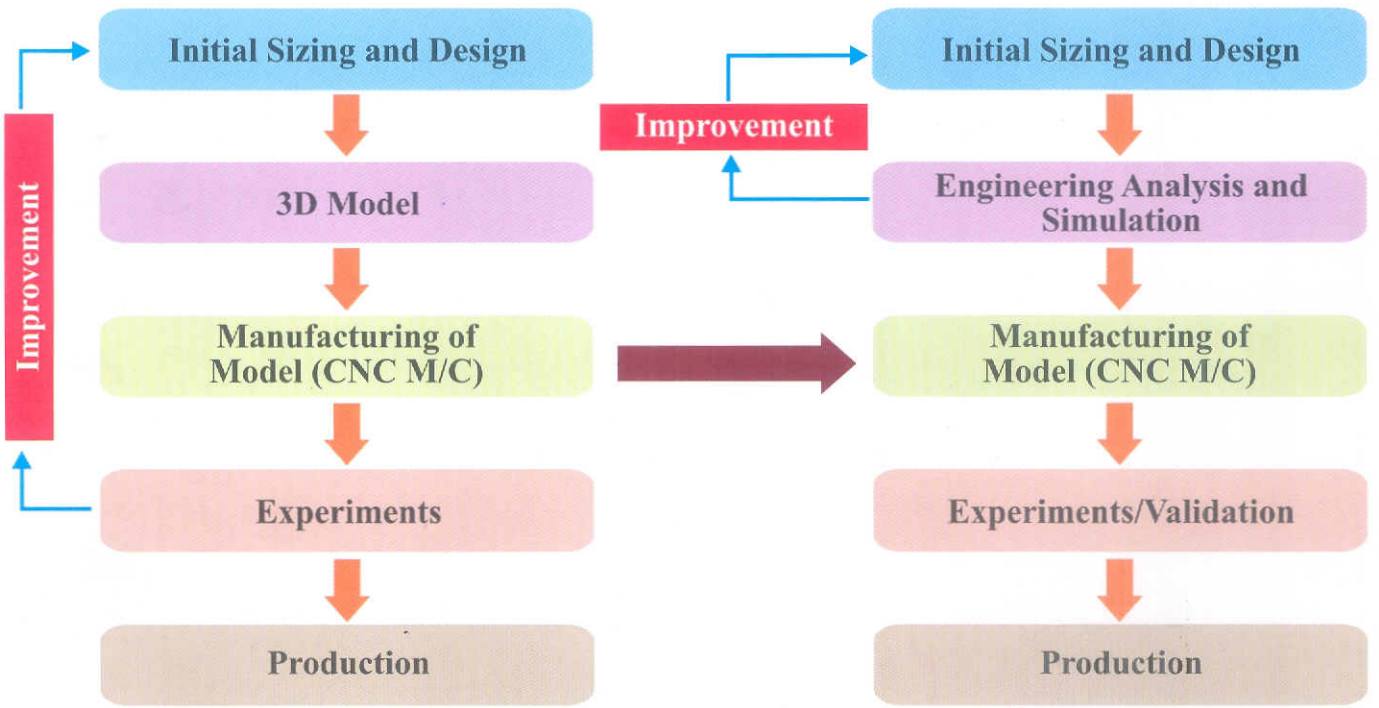


Cut Vertical Motor

TETV Horizontal Motor

Product development through technological innovations based on Model Design Cycle has been modified using Engineering Analysis and Simulation as follows :

Modification of Model design cycle

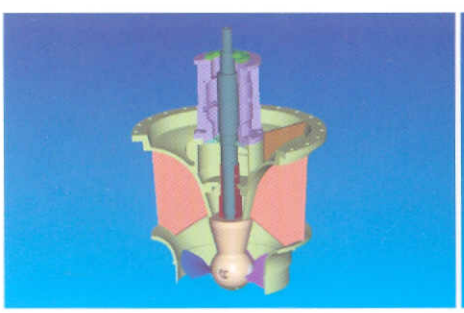


Engineering Analysis and Simulation has helped Jyoti :

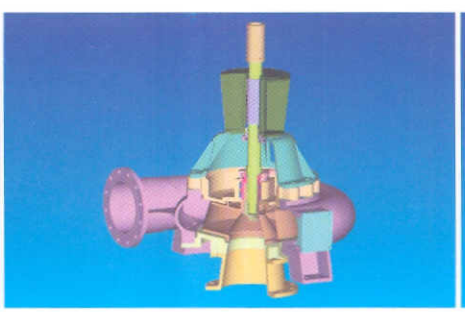
- To predict and enhance equipment performance for efficiency / cavitation with better understanding of physics.
- To design a product which leads to higher customer satisfaction with better product performance.
- To improve / upgrade existing design methodologies based on advance analysis techniques "CFD-FEA" / field performance data.
- To determine optimum solution of a problem.
- To reduce product-development-cycle-time and cost.
- To develop specific product to suit individual customer requirement, e.g.
  - For Indian Navy : Special two-stage pump with very low NPSH for submarine.
  - For Karnataka Neeravari Nigam Ltd. : 100% indigenous metallic volute pump is developed.

This has enabled Jyoti to quickly respond to customer needs. Jyoti is now in a position to accept any stringent specifications of customers and quickly process the same to design and deliver the products on time.

With this Jyoti has moved to an elite class of manufacturers who can offer better solutions to customers based on virtual engineering.



Vertical Propeller Pump



Vertical Non-Clog Pump

Horizontal Non-Clog Pump

Software Assets & Infrastructure at Jyoti's Design Centre

Software

- **Analysis**
  - ANSYS
    - Mechanica
    - CFX
    - Maxwell
    - RMxprt
  - ThermNet
  - MagNet
  - Mathcad
- **Modeling & Drawing**
  - Pro/E - Wildfire
  - Autocad
  - Inventor
  - Solidworks
  - Catia
- **Machining**
  - Unigraphics
  - Hypermill **(CNC M/C)**

Hardware

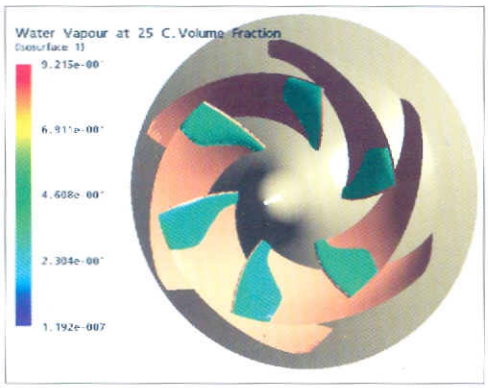
- **Analysis**
  - High-end latest HP-Z800 Work-station-8 No.
  - Two 3.4 GHz Intel Xeon Quad Core processors.
  - 32 GB RAM
  - 1 Gbps connection.
  - 1 GB Nvidia quadro graphics card.
- **Modeling & Drawing**
  - High-end latest HP-Z400 Work-station-35 No.
  - 2.67 GHz Intel Xeon Quad Core processor
  - 8 GB RAM
  - 1 GB Nvidia quadro graphics card
  - 24" Monitor screen

Talent

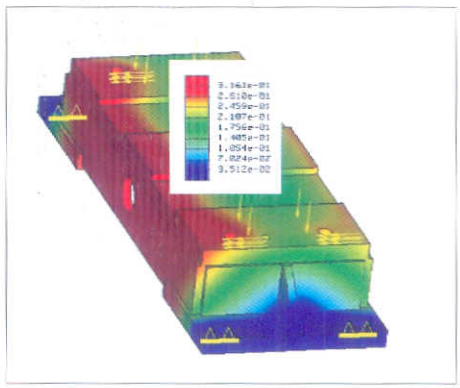
• Ph.D.	- 02
• Post Graduate in Technology	- 15
• Graduate in Engineering	- 30
• Diploma in Engineering	- 20
• Mechanical Draftsman	- 20
Total workforce Technology Centre	**- 87**

Hydraulic & Mechanical Engineering Analysis & Simulation Software

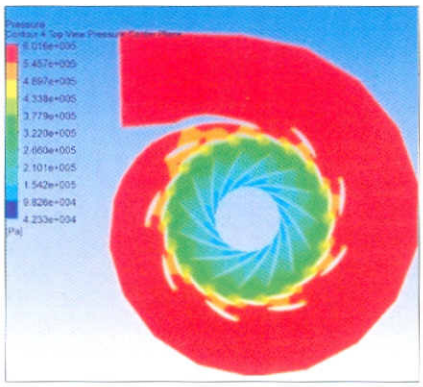
ANSYS CFX **ANSYS Mechanical** **ANSYS Maxwell**



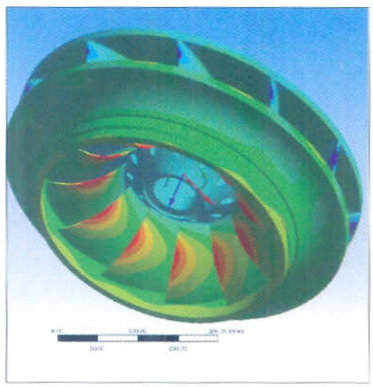
Cavitation Analysis of Impeller



FEA Analysis of Bearing Bracket

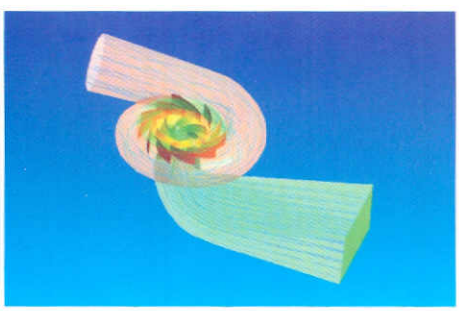


Pressure Contour Plot in Francis Turbine

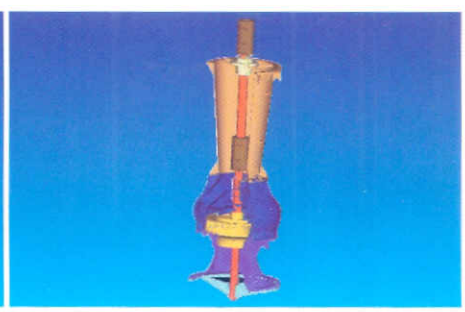


FEA Analysis of Francis Turbine

Horizontal Split-Casing Pump



CFD Analysis of Volute Pump

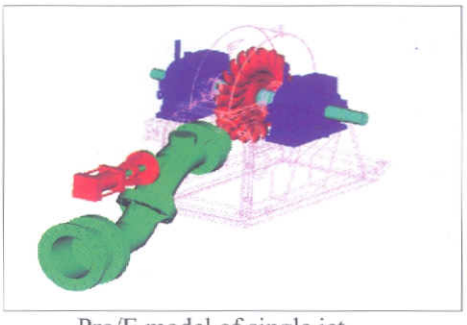


Vertical Mixed-Flow Pump

PTC Awards Competition Industrial Equipment Category

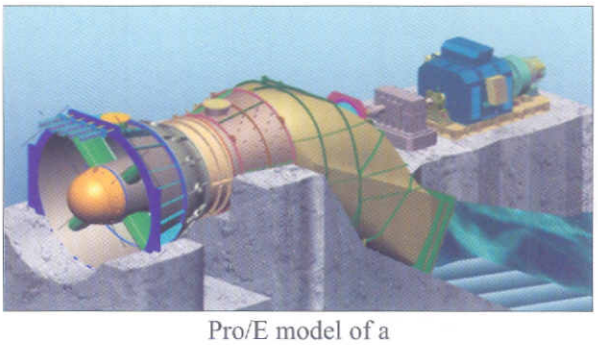
PTC Awards 2000 Competition is an international forum for PTC customers to display their successful achievements using PTC solutions. Using Pro/ENGINEER, Pro/MECHANICA & WINDCHILL software tools, Jyoti was able to create and engineer a highly realistic electronic model, making design changes, produce a superior product, resulting in significant reduction in 'time to market'.

One of the top Five Entries - 2000



Pro/E model of single jet horizontal pelton turbine.

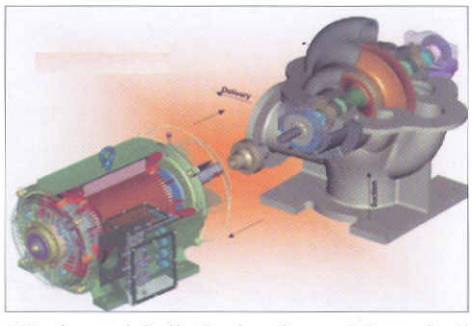
One of the top Five Entries - 2001



Pro/E model of a horizontal tubular turbine.

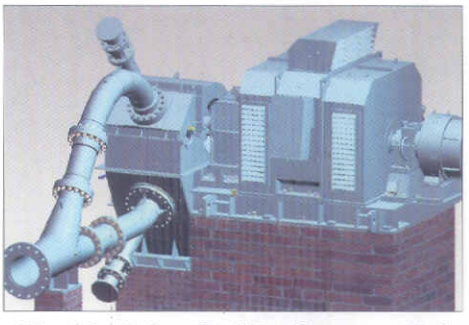
D Model of horizontal split-casing pump motor set

One of the top Five Entries - 2004

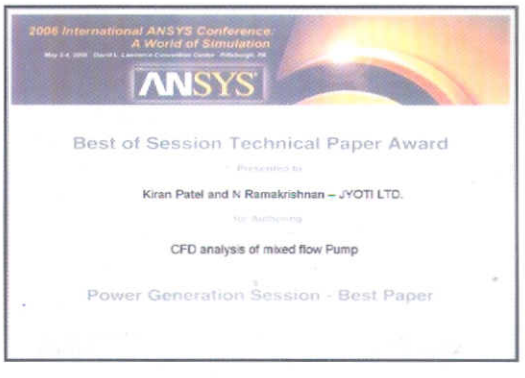


"Horizontal Split Casing Pump-Motor Set"

One of the top Five Entries - 2006



"Dual Jet Pelton Turbine-Generator Set"



Jyoti Ltd. VADODARA (INDIA)

Water • Power • Progress

FOR FURTHER ENQUIRIES PLEASE CONTACT

Design Centre

Nanubhai Amin Marg, Industrial Area,
P.O. Chemical Industries,
Vadodara-390 003.
Phones : 0091-265-3054444, 3054589
Fax : 0091-265-2281871, 2280671
E-Mail : jyotiltd@jyoti.com
proe@jyoti.com
pumprnd@jyoti.com
hydrnd@jyoti.com
remrnd@jyoti.com
Website : http://www.jyoti.com

BRANCH OFFICES

- **Ahmedabad** : 406, Akshat Tower, Opp. Rajpath Club, Havmor Restaurant Lane, Bodakdev, Ahmedabad-380 054. Ph. : 079-26870980, Fax : 079-26871051, Email : ahmedabad@jyoti.com, jyotiahm@gmail.com
- **Bangalore** : No. 94, 10th Cross, East Park Road, Malleswaram,, Bangalore-560 020. Telefax : 080-23562248 E-Mail : bangalore@jyoti.com
- **Chennai** : VEE DEE YEM Complex, 1st Floor, 270, Lloyds Road, Royapettah, Chennai 600014, Ph. : 044-28131754, Fax : 044-28133178, E-Mail : chennai@jyoti.com
- **Indore** : Office No. 502, 5th Floor, Capt. C.S. Naidu Arcade, Nr. Greater kailash Hospital, Old Palasia, Indore 452 001. Telefax : 0731-2542621, E-mail : indore@jyoti.com, jyotiindore@rediffmail.com
- **Kolkata** : 45, Jhowtalla Road, Syed Amir Ali Avenue, Kolkata-700 019, Ph. : 033-22902056, 32487527 Fax : 033-22875267, E-Mail : kolkata@jyoti.com
- **Mumbai** : Narsinh Sadan, Flat No. 102, 1st Floor, 1st Road, Golibar, Santacruz (East), Mumbai-400 055. Ph. : 022-26134403 (D), 26122848, Fax : 022-26100717, E-Mail : mumbai@jyoti.com
- **New Delhi** : 7, Jantar Mantar Road, New Delhi-110 001. Ph. : 011-23340576, Telefax : 011-23340205, E-mail : delhi@jyoti.com
- **Pune** : "Omkar", Plot No. 14, Sevanand Society, Sant Nagar, off Pune Satara Road, Pune-411 009. Ph. : 020-24231420, E-Mail : hemant_hsg@yahoo.co.in
- **Secunderabad** : 5-4-187/7, 1st Floor, Karbala Maidan, M.G.Road, Secunderabad - 500 003. Ph. : 040-27544587(D), 27541608, Fax : 040-27543673, E-Mail : jyotisec@yahoo.com, jyotisec@jyoti.com

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