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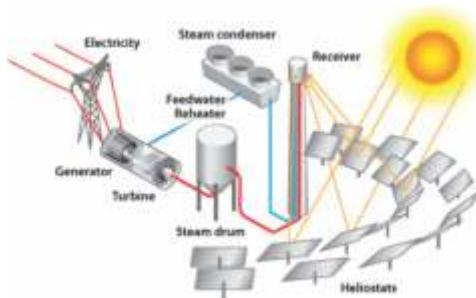
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Harnessing the Power of Sun through CSP

Archimedes, the Greek engineer from the third century B.C., defended his home of Syracuse from a besieging Roman fleet by focusing sunlight reflected off highly polished shields onto the ships, setting them afire. As a historical matter, it's probably a myth, but illustrates the power of solar energy. When concentrated to a high degree, sunlight generates intense heat. Capturing that heat and putting it to work has captivated minds of engineers since Archimedes's time. However, it has taken advances in material science and control technologies to bring this ancient dream to the cusp of practical power production.

Concentrating Solar Power (CSP) technique is not to be confused with photovoltaic technique of electricity generation. In photovoltaic systems, the concentrated sunlight is converted directly to electricity via the photovoltaic effect. In CSP, the concentrated sunlight is converted to heat, and then the heat is used to generate steam for producing mechanical power, which in turn is converted to electricity.



Schematic diagram of a concentrating solar power system

In concentrating solar power, numerous large, flat, sun-tracking mirrors, known as *heliostats*, focus sunlight onto a receiver at the top of a tall tower. A heat-transfer fluid heated in the receiver is used to generate steam, which, in turn, is used in a conventional turbine generator to produce electricity. Some power towers use water/steam as the heat-transfer fluid. Other advanced designs are experimenting with molten nitrate salt because of its superior heat-transfer and energy-storage capabilities. Individual commercial plants can be sized to produce up to 200 MW of electricity.

The potential for CSP is enormous. More solar energy reaches the earth in one hour than the combined worldwide consumption of energy by human activities in one year. A recent study by the International Energy Agency's Solar PACES group, in conjunction with the European Solar Thermal Electricity Association

and Greenpeace International, suggested that concentrating solar power systems could provide up to 25 percent of the world's electricity needs by 2050.

CSP is being widely commercialized and its market has seen about 740 MW of generating capacity added between 2007 and 2010. More than half of this (about 478 MW) was installed during 2010, bringing the global total to 1095 MW. Spain added 400 MW in 2010, taking the global lead with a total of 632 MW, while the US ended the year with 509 MW after adding 78 MW, including two fossil-CSP hybrid plants. The Middle East is also ramping up their plans to install CSP based projects and as a part of that Plan, Shams-I the largest CSP Project in the world has been installed in Abu Dhabi.

CSP growth is expected to continue at a fast pace. As of April 2011, another 946 MW of capacity was under construction in Spain with total new capacity of 1,789 MW expected to be in operation by the end of 2013. A further 1.5 GW of parabolic-trough and power-tower plants were under construction in US, and contracts signed for at least another 6.2 GW. Interest is also notable in North Africa and Middle East, as well as in India and China.

India had planned to set up a 35 MW plant based on CSP in Rajasthan way back in 1994, but the project was postponed indefinitely because no qualified contractors were able to submit a bid. Now, of course, the situation has changed. The Jawaharlal Nehru National Solar Mission (NSM) recognises CSP as a key source of renewable power. The Ministry of New and Renewable Energy is setting up a string of demonstration projects. A 2.5 MW solar thermal power plant has been commissioned near Bikaner by ACME, a private company. The plant will be scaled upto 10MW in the near future. CSP could be an attractive option for the country, given the fact that large areas of northwest India fall in the high radiation zone. The costs can also be brought down if concentrating mirrors and receiving tubes are manufactured locally.

Jawaharlal Nehru National Solar Mission has catalyzed India's small but growing solar energy market. NSM is divided into three phases and aims to meet target of 20,000 MW of grid-connected solar power and 2,000 MW of off-grid installations by 2022. India recently exceeded 1,000 MW of total installed solar capacity in July 2012. Presently, about seven concentrated solar power projects are in progress in Rajasthan, Gujarat and Andhra Pradesh.

In spite of the promise of CSP, the challenge is to make solar thermal energy cost competitive with fossil fuels and other alternative energy sources. This means increasing the efficiency of CSP technologies, as well as making them more affordable. This is driving the design of lower-cost mirror materials, thermal storage, scaling to larger mirrors and facilities, and higher operating temperatures.

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Mechanical Engineering, ASME Magazine, March 2013

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Dr. Sukhdeep S. Dhani, Associate Professor,
Mechanical Engineering Department

MAJOR ACHIEVEMENTS (January-March, 2013)

Shri Ashok Thakur, IAS, Secretary, Higher Education, MHRD, GOI visited the institute on 10.03.2013 and had a brief interaction with Nodal Centres for Induction Training Programme through ICT and the faculty of the institute. He appreciated the role of the institute and assured support for strengthening infrastructure facilities and resources. He emphasized that during 12th Five Year Plan, especially in the Mission on Teachers & Teaching and TEQIP, the institute has to play an important role.



NATIONAL SEMINAR ON SUSTAINABLE DEVELOPMENT OF RURAL INDIA BY 2022 (7-8 MARCH, 2013)



Dr. Abhijit Sen, Member, Planning Commission, GOI delivering the inaugural address



Delegates of the seminar

A two day National Seminar on “Sustainable Development of Rural India by 2022” was organised by Rural Development Department on 7–8 March, 2013. Dr. Abhijit Sen, Member, Planning Commission, Government of India, delivered inaugural address in the seminar. Delegates numbering 160 including 40 organic farmers and entrepreneurs participated in the seminar. Dr. Sen also inaugurated the Organic and Herbal Products Mela organized by organic farmers and entrepreneurs. Dr. M P Poonia, Director of the Institute apprised the participants about the institute activities. He emphasized the significant role of community polytechnics for rural development and elaborated on the status of agriculture and rural environment. Dr. JS Saini, Professor & Head, Rural Development Department welcomed the delegates and highlighted the role of Department of Rural Development. Dr. U N Roy, Associate Professor presented the background paper on the theme of the seminar and co-ordinated the two day seminar-cum-Organic Mela. Dr. Santosh Satya, Professor, Centre for Rural Development and Technology, IIT Delhi chaired the session on “Women Empowerment with respect to Health, Sanitation and Sustainable Livelihood” on International Women's Day on 8th March, 2013. Dr. RR Gaur, Former Professor, IIT Delhi, Chief Guest for the Valedictory Session called for concerted and integrated efforts for sustainable rural development with change in mindset of common masses as well as intellectuals. Fifty five papers were presented during the seminar by eminent scientists, environmentalists, social activists, farmers and entrepreneurs. The recommendations of the seminar will be sent to Planning Commission, Ministry of Rural Development, Ministry of Environment and Ministry of HRD.

NATIONAL WORKSHOP ON “DISABILITY THROUGH THE LENS OF ART AND CULTURE” 23-24 MARCH, 2013

A National Workshop on “Disability through the Lens of Art and Culture” was held at NITTTR, Chandigarh on 23 March, 2013. The workshop was jointly organized by the Society for Disability and Rehabilitation Studies [SDRS], New Delhi and NITTTR, Chandigarh. Besides discussion on various issues pertaining to disability, 25 wheel chairs and tricycles were given to the orthopedically handicapped persons. Wheel chairs and tricycles were sponsored by the State Bank of India, Chandigarh. Prominent among those who were present during the event included Dr. GN Karna, Honorary President, SDRS, New Delhi; Dr. VJS Vohra, Prosthetic Advisor to the Chandigarh Administration; Dr. Gurdeep Singh Deep, Chairman, Cheshire Homes, Chandigarh; Dr. Digamber Behera Professor, PGI Chandigarh, Dr. JS Saini from NITTTR, Chandigarh and Dr. Dharamvir from PGI Chandigarh. State Bank of India, Chandigarh and Central Bank of India, Chandigarh expressed their willingness to get associated with similar events to be organized by SDRS and NITTTR, Chandigarh in future.

A MASTER TRAINER TRAINING PROGRAMME ON 'QUALITY MANAGEMENT SYSTEM AND QUALITY TECHNOLOGY TOOLS'



Participants of the training programme

A Master Trainer Training Programme on 'Quality Management System and Quality Technology Tools' was organised by Quality Council of India, New Delhi at NITTTR, Chandigarh from 11-15 March, 2013 in which 25 faculty members from four NITTTRs participated. These master trainers will in turn train 500 polytechnic teachers in their respective regions to enhance the quality of the products of the Micro, Small and Medium Enterprises.

Training programmes conducted during January-March, 2013

| Particulars | Number of Programmes | Number of Participants |
|---|----------------------|------------------------|
| Polytechnics | 26 | 384 |
| Engineering Colleges | 29 | 337 |
| Induction training programmes through ICT | 48 | 1996 |

TRAINING PROGRAMMES (APRIL-JUNE, 2013) *

POLYTECHNICS

1. Effective Teaching and Classroom Communication, GP Kota, 1-12 Apr.
2. Eco-Water Literacy & Sanitation Awareness Camp, DJ Polytechnic, Baraut, 9-12 Apr.
3. Entrepreneurial Awareness Camp, GILFT, Jalandhar, 10-12 Apr.
4. Educational Auditing of Technical Institutions , 15-19 Apr.
5. Repair and Maintenance of Power Supplies, GP Amritsar, 22-26 Apr.
6. Project Planning and Management, 29 Apr. - 3 May
7. E- Content Generation, NITTTR CHD/Outstation, 29 Apr - 3 May
8. Trends & Directions in International Entrepreneurship & Management, 29 Apr.- 3 May
9. Linux Administration, GPW Jammu, 29 Apr. - 3 May
10. MATLAB Programming, TTC Jodhpur, 29 Apr. - 3 May
11. VLSI Design, 29 April - 3 May
12. Electrical, Electronics and Computer Based Projects, GP Ambala, 29 Apr. - 3 May
13. Student Evaluation, CCET (Diploma Wing), Chandigarh, 29 Apr.- 3 May
14. Nanotechnology: Opportunity and Challenges, 06 -10 May
15. Water Conservation and Artificial Recharge Methods, 06 -10 May
16. Laboratory Applications in Quality Control of Concrete, 06 -10 May
17. Strategic Management and SWOT Analysis for Institutional Excellence, 06 -10 May
18. Office Automation for Faculty and Staff, GP Bathinda, 06 -10 May
19. Dynamic Web Site Designing, 06 -10 May
20. Competencies for 21st Century, GPW Chandigarh, 06 -10 May
21. Skill Development and Income Generation in Rural Areas, 06 -10 May
22. Construction and Maintenance of Roads, 13 -17 May
23. Ubiquitous Computing, 13 -17 May
24. Power Electronics, 13 -17 May
25. GSM and CDMA, 13 -17 May
26. Research Methodology and Project Management, BPIBS Delhi, 13 -24 May
27. Classification by DDC and Cataloguing by AACR2, 13 -24 May
28. Physics Laboratory Organization and Updating, NITTTR/J&K, 20 -24 May
29. Analytical Methods for Water and Waste Water Testing, 20 -24 May
30. Animations for Web, 20 -24 May
31. Hardware Maintenance and Networking for Technicians, 20 -24 May
32. Cloud Computing ,BPIBS, Delhi, 20 -24 May
33. Communication Skills, 20 -24 May
34. Repair and Maintenance of UPS, SMPS etc. J&K, 20 -24 May
35. Laboratory Practices in Civil Engineering, 27 -31 May
36. Latest Instructional Media Operation and Maintenance, 27 -31 May
37. Entrepreneurship, Creativity, Innovation & Incubation Using Blue Ocean Strategies, 27-31 May

38. VB. Net, 27 -31 May
39. Setting and Marking Question Papers, 27 -31 May
40. Auto CAD, 27 -31 May
41. Technical & Vocational Education for Sustainable Development in collaboration with CPSC, Manila, 27 May -01 June
42. Entrepreneurial Awareness Camp, GP Leh, 03-05 June
43. MATLAB Programming, KGP Srinagar, 03-07 June
44. Power Supply Design, Fabrication and Testing, CCET Chandigarh, 03-07 June
45. Recent Advancements and Repair and Maintenance of Storage Batteries, 17-21 June
46. Strategic Planning & Management of Technical Institution, KGP Srinagar, 17-21 June
47. Institutional Management, KGP Srinagar, 24-28 June

ENGINEERING COLLEGES

1. Educational Auditing for Technical Institutions, 15-19 Apr.
2. Research Methodology, MIMIT Malout, 15-19 Apr.
3. TCP/IP Based Computer Network, GEC Ajmer, 16-20 Apr.
4. Wireless and Mobile Communication, GEC Bikaner, 29 Apr.-03 May
5. Electrical, Electronics and Computer Based Projects, GP Ambala, 29 Apr.-03 May
6. Nanotechnology: Opportunity and Challenges, 06-10 May
7. Dynamic Website Designing, 06-10 May
8. Strategic Management and SWOT Analysis for Institution Excellence, 06-10 May
9. Ubiquitous Computing, 13-17 May
10. Power Electronics, 13-17 May
11. Classification by DDC and Cataloguing by AACR2, 13-24 May
12. Physics Laboratory Organization and Updating, 20-24 May
13. Animations for Web, 20-24 May
14. Hardware Maintenance and Networking for Technicians, 20-24 May
15. MATLAB & LabVIEW, BRCM CET, Bahal, (HA), 20-24 May
16. VB.Net, 20-24 May
17. Entrepreneurship, Creativity, Innovation and Incubation using Blue Ocean Strategies , 20-24 May
18. Soft Computing Using Sci-Lab, NITTTR CHD/ Outstation, 20-24 May
19. Auto CAD, 20-24 May
20. Latest Instructional Media Operation and Maintenance, 20-24 May

Note: The above programmes will be conducted at NITTTR, Chandigarh unless otherwise stated.

* For details please visit our institute website: www.nitttrchd.ac.in

VISIT OF INTERNATIONAL DELEGATION TO THE INSTITUTE

A delegation of 40 participants of an International Training Programme on "Innovative Leadership for Organisation Growth & Excellence (ILOGE)" organised by National Institute of Entrepreneurship and Small Business Development (NIESBUD), Noida, UP visited this institute on 04.03.2013. The visiting delegation included participants from 24 countries namely, Sri Lanka, Ethiopia, Madagascar, Colombia, Oman, Tunisia, Indonesia, Uzbekistan, Lithuania, Tajikistan, Kazakhstan, Afghanistan, Bhutan, Nigeria, Niger, South Africa, Lesotho, Uganda, Kenya, Mauritius, Myanmar, Bangladesh and Zimbabwe. They interacted with the Director and the senior faculty members of this institute regarding promotion and development of entrepreneurship and MSME activities in India.

DST SPONSORED FACULTY DEVELOPMENT PROGRAMME

A two week DST - NIMAT, Govt. of India sponsored Faculty Development Programme was organised by Entrepreneurship Development and Industrial Coordination (EDIC) Department from 18-29 March 2013. The program was coordinated by Dr. D.D. Sharma, Professor & Head, EDIC Department. The objective of this FDP was to create awareness and appreciation about Entrepreneurship Development among the faculty so that entrepreneurial culture is cultivated in polytechnics and engineering colleges of the country. 15 teachers from polytechnics and engineering colleges of various states of the country attended this programme. Various theoretical and practical aspects were deliberated upon during this programme. In addition, industrial visits, interactions with successful entrepreneurs were organised and case studies were presented in the programme.

EMPOWERMENT OF THE PERSONS WITH HEARING IMPAIRMENT

A two-day National Conference on "Empowerment of the Persons with Hearing Impairment" was jointly organized by Ali Yavar Jung Institute for the Hearing Impaired [AYJNIHH], Mumbai and NITTTR, Chandigarh on 21 and 22 March, 2013. Smt. Geeta Bhukkal, Cabinet Minister [Education, Social Justice & Empowerment, Welfare of SCs/BCs, Women and Child Development, Industrial Training, Archaeology & Museums and Archives] Govt of Haryana in her inaugural address, appreciated the initiatives of the institutes for early identification, rehabilitation, education, training and placement of persons with hearing impairment. Dr. Raj Bahadur, Director Principal, Govt Medical College and Hospital, Chandigarh, Guest of Honour called for cooperation of all concerned for ultimate empowerment of the persons with hearing impairment. Dr. MP Poonia, Director, and Dr. JS Saini, Conference Coordinator, also addressed the conference delegates.

83 persons representing academicians, researchers, policy formulators, NGOs, universities, disability activists and deaf community participated in the conference. In all, five technical sessions were conducted. Recommendations of the conference shall be made available to the organizations working in the area of disability.

9th INTER NITTTR SPORTS MEET



9th Inter NITTTR Sports meet was organised at NITTTR, Chandigarh from 19-22 February, 2013. Shri Ramavtar Singh Jakhar, Vice President, Rajasthan Olympic Association inaugurated the sports meet on 19th February, 2013. Over 100 participants and officials from various NITTTRs participated in the meet. Various events such as Badminton, Table Tennis, Carrom, Volleyball, Auction Bridge, Chess and 100m Race were organised. NITTTR, Chandigarh won the championship trophy. Shri M P Singh, IAS, Principal Secretary to Governor of Punjab was the Chief Guest during the valedictory ceremony.

SIGNING OF MoU

Memorandum of Understanding was signed between Ministry of Human Resource Development, Government of India and NITTTR, Chandigarh on February, 2013 for implementation of Technical Education Quality Improvement Programme (TEQIP-II).



Participants of DST sponsored training programme



Hon'ble Smt. Geeta Bhukkal, Cabinet Minister delivering the inaugural address

Farewell

Mrs. Janak Dulari, Senior Translator

superannuated on 31.01.2013

Mrs. Poonam Saini, Assistant Professor,

Computer Science Department resigned on 18.03.2013

Welcome

Dr. Komal, Assistant Professor,

Applied Science Department joined on 15.03.2013

Articles and news items regarding innovative projects in technical education are invited from teachers, administrators and others.