List of Journal appended

1. Heat transfer characterization and optimization of latent heat thermal storage system using fins for medium temperature solar applications

Heat transfer characterization and optimization of latent heat thermal storage system using fins for medium temperature solar applications

Authors	Asmita Shinde, Sankalp Arpit, Pramod KM, Peddy V C Rao, Sandip K Saha
Publication date	2017/6/1
Journal	Journal of Solar Energy Engineering
Volume	139
Issue	3
Publisher	American Society of Mechanical Engineers Digital Collection
Description	While solar thermal power plants are increasingly gaining attention and have demonstrated their applications, extending electricity generation after the sunset using phase change material (PCM) still remains a grand challenge. Most of the organic PCMs are known to possess high energy density per unit volume, but low thermal conductivity, that necessitates the use of thermal conductivity enhancers (TCEs) to augment heat transfer within PCM. In this paper, thermal performance and optimization of shell and tube heat exchanger-based latent heat thermal energy storage system (LHTES) using fins as TCE for medium temperature (< 300 C) organic Rankine cycle (ORC)-based solar thermal plant are presented. A commercial grade organic PCM, A164 with melting temperature of 168.7 C is filled in the shell side and heat transfer fluid (HTF), Hytherm 600 flows through the tubes. A three-dimensional numerical model …
Total citations	Cited by 25

2. Effect of nanofluid concentration and composition on laminar jet impinged cooling of heated steel plate

Effect of nanofluid concentration and composition on laminar jet impinged cooling of heated steel plate

Authors	Manoj K Singh, Darvik Yadav, Sankalp Arpit, Sourav Mitra, Sandip K Saha
Publication date	2016/5/5
Journal	Applied Thermal Engineering
Volume	100
Pages	237-246
Publisher	Pergamon
Description	In this paper, an experimental investigation of heated steel surface cooled by laminar nanofluid jets and its comparison with water jets are presented. The effects of concentration and jet velocity of TiO_2 based nanofluid on cooling rate are evaluated experimentally. Further, the cooling rates of TiO_2, Al_2O_3, and SiO_2 nanofluids with same concentration and velocity are compared. The total heat flux is deduced from the experimentally obtained cooling curves by using a one-dimensional finite volume method based transient inverse heat transfer model. It is found that heat transfer is enhanced using nanofluid jets when compared to water. Increase in concentration of TiO_2 nanoparticle in nanofluid leads to an increase in CHF. Further, it is also observed that the shift from film boiling to transition boiling is faster for nanofluid jet cooled surface.
Total citations	Cited by 16

3. Thermodynamic Analysis of GT Cycle with Naphtha or Natural Gas as the Fuel: A Thermodynamic Comparison

Thermodynamic Analysis of GT Cycle with Naphtha or Natural Gas as the Fuel: A Thermodynamic Comparison

Authors	S Arpit, PK Das, SK Dash
Publication date	2019/1/15
Journal	International Journal of Energy and Environmental Engineering
Volume	13
Issue	1
Pages	7-10
Description	In this paper, a comparative study is done between two fuels, naphtha and natural gas (NG), for a gas turbine (GT) plant of 32.5 MW with the same thermodynamic configuration. From the energy analysis, it is confirmed that the turbine inlet temperature (TIT) of the gas turbine in the case of natural gas is higher as compared to naphtha, and hence the isentropic efficiency of the turbine is better. The result from the exergy analysis also confirms that due to high turbine inlet temperature in the case of natural gas, exergy destruction in combustion chamber is less. But comparing two fuels for overall analysis, naphtha has higher energy and exergetic efficiency as compared to natural gas.
Total citations	Cited by 1

4. ASSESSMENT OF SUSTAINABILITY INDICATORS OF TWO GAS-TURBINE PLANTS WITH NAPHTHA AND NAPHTHA-RFG MIXTURE AS FUELS

ASSESSMENT OF SUSTAINABILITY INDICATORS OF TWO GAS-TURBINE PLANTS WITH NAPHTHA AND NAPHTHA-RFG MIXTURE AS FUELS [PDF] from grdspublishing.org

Authors	Sankalp Arpit, Prasanta Kumar Das, Sukanta Kumar Dash
Publication date	2020/3/13
Journal	MATTER: International Journal of Science and Technology
Volume	6
Issue	1
Description	To enhance sustainability of any energy system exergy based sustainability indicators (exergy efficiency, waste exergy ratio, environmental effect factor and exergetic sustainability index) are used. In the present paper sustainability aspects of two GT based power plant are carried out using sustainability indicators. For this purpose, two GT1) configurations, case A (Naphtha based GT power plant) and case B (Naphtha-Residual fuel gas mixture GT 2) are taken up as case study. Results show that exergetic sustainability index obtained as for case A is higher as compared to case B.
Scholar articles	ASSESSMENT OF SUSTAINABILITY INDICATORS OF TWO GAS-TURBINE PLANTS WITH NAPHTHA AND NAPHTHA-RFG MIXTURE AS FUELS S Arpit, PK Das, SK Dash - MATTER: International Journal of Science and …, 2020

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Near Swimming Pool, IIT Kharagpur,

West Bengal, India.

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Sankalp Arpit

Education:

Ph. D. (Energy Technology) **July 2015 -**

Indian Institute of Technology Kharagpur, West Bengal, India

Academic Advisor: Prof. P.K. Das, Department of Mechanical Engineering, IIT Kharagpur

Prof. S.K. Dash, Department of Mechanical Engineering, IIT Kharagpur

Synopsis Seminar : - (Expected in 2020)

M Tech (Energy Technology) **July 2011 - July 2013**

Birla Institute of Technology, Mesra, Jharkhand, India

Academic Advisor: Prof. Sabin Kumar Mishra, Higher Colleges of Technology, United Arab Emirates.

Dissertation: - CFD analysis of solar flat collector.

B Tech (Mechanical Engineering) **July 2005 - July 2009**

Sikkim Manipal Institute of Technology, Rangpo, Sikkim, India

Academic Advisor: Prof. B.B. Pradhan

Prof. A.P. Tiwary

Prof. Ruben Phipon

Dissertation: - Micro-Electro-Discharge Machining (Micro-EDM) of C-40 Steel

Professional Experience:-

- Teaching assistant in NPTEL May 2017-October 2017
- Junior Research Fellow, IIT(Bombay) August 2014 - July 2015
- Assistant Professor, Manipal Institute of Technology July 2013 - July2014
- Teaching Assistantship in BIT Mesra. December 2011-October 2012

Awards and honors:-

- Best paper award in 4th ICSTR Singapore- International conference on Science and technology research held at NUSS Singapore. Nov 15-16, 2019
- Plenary Speaker in 4th ICSTR Singapore- International conference on Science and technology research held at NUSS Singapore. Nov 15-16, 2019
- Technology programme committee member in "The 5th international Conference on Energy, Environment and Material Sciences" (EEMS). June 21-23,2019
- Best paper award in International Conference in Energy, Environment and Sustainable Development held in Paris (France). Jan 24-25,2019
- Session chair person in International Conference in Energy, Environment and Sustainable development held in Paris (France). Jan 24-25,2019
- Institute scholarship in IIT Kharagpur. July 2015-August 2020
- Junior research fellow in IIT Bombay (DST). August 2014-July 2015
- MHRD fellowship during Masters. July 2011- July 2013
- NIIT fellowship in DPS Ranchi.

Publications in Peer-Reviewed Journals:-

- M. K. Singh, D. Yadav, **S. Arpit**, S. Mitra, and S. K. Saha, 'Effect of nanofluid concentration and composition on laminar jet impinged cooling of heated steel plate', Appl. Therm. Eng., vol. 100, 2016.
- A. Shinde, **S. Arpit**, P. Km, P. V. C. Rao, and S. K. Saha, 'Heat Transfer Characterization and Optimization of Latent Heat Thermal Storage System Using Fins for Medium

Temperature Solar Applications', J. Sol. Energy Eng. Trans. ASME, vol. 139, no. 3, 2017.

- **S. Arpit**, P.K.Das, S.K.Das, 'Thermodynamic analysis of GT fuel with Naphtha or Natural gas as the Fuel: A Thermodynamic Comparison', International Journal of Energy and Environmental Engineering, Vol: 13, No: 1, 2019.
- **S.Arpit**, P.K.Das, S.K.Das, 'Assessment of sustainability indicators of two gas turbine plants with naphtha and naphtha-Rfg mixture as fuels', Matter: International Journal of science and technology, Vol: 6, No: 1, 01-14.

Conferences:-

- ICEESD 2019-21st International Conference on Energy, Environment and Sustainable Development. Paris, France. (January 24-25, 2019)
- 4th ICSTR-International Conference on Science & Technology Research. Singapore. (15-16 November, 2019)
- 7th ICAER- International Conference on Advances in Energy Research held in IIT Bombay. (10-12 December, 2019)
- 21st Century Energy Needs- Materials, Systems and Applications. (17-19 Nov,2016)

Invited Talk, Posters and Workshops:-

- Poster presentataion on Research Scholar day in School of Energy Science and Engineering, IIT Kharagpur (12th March,2016)
- Certificate of Excellence in Rangmanch (Street Play) in Sikkim Manipal Institute of Technology. (28th August-30th August, 2008)
- Certificate of Appreciation in Hospitality committee in Sikkim Manipal Institute of Technology. (1st November-3rd November, 2007)
- Certificate of Appreciation from "MEDUSA" in Sikkim Manipal Institute of Technology. (2007)
- Certificate of Appreciation in enterprise awareness campaign in Sikkim Manipal Institute of Technology. (14th Feb-16th Feb, 2009)

- Certificate of Participation in Engineering problem solving using MATLAB in Sikkim Manipal Institute of Technology. (30th September - 2nd October 2007)
- Participated in group song in Golden Jublee Cultural Programme held in East Champaran Motihari. (1998)

Technical Report:-

- Technical report to Haldia Petrochemicals Limited under the guidance of Prof. P.K. Das and Prof.S.K.Dash. (2nd November, 2017)
- Technical report to Haldia Petrochemicals Limited under the supervision of Prof. P.K. Das and Prof. S.K.Dash. (8th August, 2016)
- Development of thermal storage system using phase change material for orc based solar thermal plant (project no. DST/SERI/2K12/59(G)) to DST. (April 2015)

Review of Journal paper/Conference paper:-

- PaperID: JTEN-2019-101
  Title : Experimental Investigation on Thermal Behavior of Hybrid Single slope solar still for Journal of Thermal Engineering.

- Ms.Ref.No.: ICAMPD-2019_paper_99
  Title: Two-phase flow analysis in elbow bend pipe used in Oil Extraction Process: A Computational Approach for ICAMPD-2019 conference proceeding.

- Ms.Ref.No.: ICAMPD-2019_paper_69
  Title: Heat Transfer and Pressure drop Assessment of a Vortex Generator Supported Fin-and-tube Heat Exchanger for ICAMPD-2019 conference proceeding.

Projects Overview:-

- **Performance analysis of combined cycle power plant with combined heat and power** : In todays scenarios when environemental degradation has become one of the most challenging topic, this type of study gains a lot of imporatance. It includes energy and exergy analysis which detects true potential of energy system. The

combination of energy and exergy analysis helps us to determine true potential of energy system leading us to a path of sustainable development.

- **Development of thermal storage system using phase change material for ORC based solar thermal power plant (Project code no.14DST014):** Since solar thermal power plants introduced has gained importance, but still electricity generation using phase change material is a major challenge. A phase change material A164 has been chosen for case study. In this project, thermal performance of shell and tube heat exchanger-based latent heat thermal energy storage system (LHTES) using fins as thermal conductivity enhancer for Organic Rankine cycle (ORC) was studied, and it was found that fin thickness and number of fin play significant role on the solidification process of PCM.

- **Effect of nanofluid concentration and composition on laminar jetimpinged cooling of heated steel plate:** An experimental investigation of heated steel surface cooled by laminar nanofluid jets andits comparison with water jets are presented. The effects of concentration and jet velocity of TiO_2 basednanofluid on cooling rate are evaluated experimentally. Further, the cooling rates of TiO_2, Al_2O_3 and SiO_2 nanofluids with same concentration and velocity are compared. The total heat flux is deduced from the experimentally obtained cooling curves by using a one-dimensional finite volume method based tran-sient inverse heat transfer model. It is found that heat transfer is enhanced using nanofluid jets whencompared to water.

Industrial training and project internships:-

- Akshay ispat & ferrous alloy (One-month training) (Sikkim manipal Institute of technology). 14^{th} July, 2008

Membership of Professional bodies/Scientific bodies:-

- Eurasia Research
    - Membership ID:- ERCICSTR1924066
    - Membership Category:- Life Time

List of students guided

Students	Current Position	Email
Vibhu Gupta	ExecutiveMBA (IIM Banglore)	vibhu.GUPTA@3ds.com
Harsha Nellore	Merchant Navy	harshanellore13@gmail.com
Leela Madhav Gutta	International Project Leader (IRIS Informatique)	glmadhav@gmail.com
Sachit Raina	Quality Assurance (Chinar Packaging Pvt. limited)	sachit.raina2010@gmail.com
Rahul Agirichetty	Solar Applications Engineer (Titanergy-USA)	rahulagirichetti@yahoo.co.in