The study of production performance of water heater manufacturing by using simulation method

By: Iqball, M (Iqball, M.)[1]; Bamatraf, OAA (Bamatraf, O. A. A.)[2]; Tadjuddin, M (Tadjuddin, M.)[1]

INTERNATIONAL CONFERENCE ON NUCLEAR ENERGY TECHNOLOGIES AND SCIENCES (ICONETS 2017)
Edited by: Sunaryo, GR; Purba, JH
Book Series: Journal of Physics Conference Series
Volume: 962
Article Number: UNSP 012019
DOI: 10.1088/1742-6596/962/1/012019
Published: 2018
Document Type: Proceedings Paper

Conference

Conference: 2nd International Conference on Nuclear Energy Technologies and Sciences (ICoNETS)
Location: Makassar, INDONESIA
Date: OCT 12-13, 2017
Sponsor(s): Natl Nucl Energy Agcy Indonesia, Deputy Nucl Energy Technol; Hasanuddin Univ, Engn Fac; Assoc Indonesian Nucl Soc; Indonesian Researcher Union BATAN Branch

Abstract

In industrial companies, as demand increases, decision-making to increase production becomes difficult due to the complexity of the model systems. Companies are trying to find the optimum methods to tackle such problems so that resources are utilized and production is increased. One line system of a manufacturing company in Malaysia was considered in this research. The Company produces several types of water heater and each type went into many processes, which was divided into twenty six sections. Each section has several operations. The main type of the product was 10G water heater which is produced most compare to other types, hence it was taken under consideration to be studied in this research. It was difficult to find the critical section that could improve the productions of the company. This research paper employed Delmia Quest software, Distribution Analyser software and Design of Experiment (DOE software) to simulate one model system taken from the company to be studied and to find the critical section that will improve the production system. As a result, assembly of inner and outer tank section were found to be the bottleneck section. Adding one section to the bottleneck increases the production rate by four products a day. The buffer size is determined by the experiment was six items.

Keywords

Author Keywords: production parameters; production performances; utilizations; production rate; waiting; simulation method

Author Information

Reprint Address: Iqball, M (reprint author)

+ Syiah Kuala Univ, Fac Engn, Dept Mech Engn, Banda Aceh, Indonesia.

Addresses:

+ [1] Syiah Kuala Univ, Fac Engn, Dept Mech Engn, Banda Aceh, Indonesia

+ [2] Int Islamic Univ Malaysia, Kulliyah Engn, Dept Mfg & Mat Engn, Selangor, Malaysia

E-mail Addresses: mohd.iqbal@unsyiah.ac.id

Publisher

IOP PUBLISHING LTD, DIRAC HOUSE, TEMPLE BACK, BRISTOL BS1 6BE, ENGLAND

Categories / Classification

Research Areas: Nuclear Science & Technology; Physics
Web of Science Categories: Nuclear Science & Technology; Physics, Applied; Physics, Multidisciplinary

See more data fields

Cited References: 10

Showing 10 of 10 View All in Cited References page *(from Web of Science Core Collection)*

1. Design of experiments for non-manufacturing processes: benefits, challenges and some examples — Times Cited: 5
   By: Antony, J.; Coleman, S.; Montgomery, D. C.; et al.
   PROCEEDINGS OF THE INSTITUTION OF MECHANICAL ENGINEERS PART B-JOURNAL OF ENGINEERING MANUFACTURE Volume: 225 Issue: B11 Pages: 2078-2087 Published: NOV 2011

2. Title: [not available] — Times Cited: 1
   By: Bhadur, R.
   Production and operation management Published: 2008
   Publisher: Book Enclave, Jaipur, India

3. 6Simulation of a Machining Sequence Using DELMIA/Quest Software — Times Cited: 15
   By: Bzymek, Z.M.; Nunez, M.; Li, M.; et al.
   Computer-Aided Design and Applications Volume: 5 Issue: 1-4 Pages: 401 - 411 Published: 2008
   [Show additional data]

4. Title: [not available] — Times Cited: 1
   By: Groover, M. P.
   Automation, Production Systems, and Computer-Integrated Manufacturing Pages: 144 Published: 2008
   Publisher: Pearson Education Inc, New Jersey

5. Modeling and Simulation of Aircraft Assembly Line Based on Quest — Times Cited: 5
   By: Lu, Hu; Liu, Xia; Pang, Wei; et al.
   ADVANCED MATERIALS DESIGN AND MECHANICS Book Series: Advanced Materials Research Volume: 569 Pages: 666-+ Published: 2012

6. A simulation analysis of the impact of production lot size and its interaction with operator competence on manufacturing system performance — Times Cited: 3
   By: Mak, Long Che; Wong, Wai Keung; Leung, Yung Sun
   SIMULATION MODELLING PRACTICE AND THEORY Volume: 49 Pages: 203-214 Published: DEC 2014

7. Application of design of experiments on the simulation of a process in automotive industry — Times Cited: 1
   By: Montevechi, J. A.; De Pinho, A. F.; Leal, F.; et al.
   2007 WINT SIM C Published: 2007
   [Show additional data]

8. Bottleneck analysis in MDF-production by means of discrete event simulation — Times Cited: 3
   By: Penker, A.; Barbu, M.C.; Gronalt, M.
   International Journal of Simulation Modelling Volume: 6 Issue: 1 Pages: 49-57 Published: March 2007

9. A spread-sheet model for efficient production and scheduling of a manufacturing line/cell — Times Cited: 6
   By: Taj, Shahram; Nedeltcheva, Galia Novakova; Pfeil, George; et al.
   INTERNATIONAL JOURNAL OF PRODUCTION RESEARCH Volume: 50 Issue: 4 Pages: 1141-1154 Published: 2012

10. The simulation design and analysis of a Flexible Manufacturing System with Automated Guided Vehicle System — Times Cited: 33
    By: Um, Insup; Cheon, Hyeonjae; Lee, Hongchul
    JOURNAL OF MANUFACTURING SYSTEMS Volume: 28 Issue: 4 Pages: 115-122 Published: DEC 2009

Showing 10 of 10 View All in Cited References page