APEM journal

Advances in Production Engineering & Management
Volume 12 | Number 1 | March 2017 | pp 75–87
https://doi.org/10.14743/apem2017.1.241

ISSN 1854-6250
Journal home: apem-journal.org
Original scientific paper

Influence of the production fluctuation on the process energy intensity in iron and steel industry

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ABSTRACT

This paper mainly studies how the production fluctuation affects the process energy intensity in iron and steel industry. First of all, the production state is divided into five conditions according to the production volatility. Meanwhile, the process energy intensity model is constructed. And model analysis showed that operating rate and qualification rate are two key parameters that represent the production volatility. A case study showed that the process energy intensity is inversely proportional to the normal production operating rate and qualification rate, but proportional to the operating rate in the other production states. Moreover, the production halt operating rate and normal production qualification rate significantly influence the process energy intensity in terms of production volatility. And then, some management suggestions were introduced on how to reduce the fluctuation of the process production. The application of the model is quantitative analysis methods, which can describe influence of production fluctuation on the process energy intensity. Based on this, corresponding measures are adopted for reducing energy consumption, including adjustment of production planning and strategy etc.

ARTICLE INFO

Keywords:
Iron and steel industry
Production fluctuation
Production state
Operating rate
Qualification rate
Process energy intensity

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Article history:
Received 24 June 2016
Revised 20 November 2016
Accepted 31 December 2016

Reference

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APEM journal

Advances in Production Engineering & Management
Letnik 12 | Številka 1 | Marec 2017 | Strani 75–87
https://doi.org/10.14743/apem2017.1.241

ISSN 1854-6250
Spletna stran: apem-journal.org
Izvirni znanstveni članek

Vpliv nihanja proizvodnje na energetsko intenzivnost v železarski in jeklarski industriji

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POVZETEK

Prispevek obravnava vpliv nihanja proizvodnje na energetsko intenzivnost v železarski in jeklarski industriji. Stanje proizvodnje je glede na nihanje proizvodnje razdeljeno na pet scenarijev. Zgrajen je model energetske intenzivnosti procesa. Analiza modela pokaže, da sta stopnja obratovanja in stopnja usposobljenosti ključna parametra, ki vplivata na nihanje proizvodnje. Narejena je tudi študija primera, ki razkrije, da je energetska intenzivnost procesa obratno sorazmerna z normalno stopnjo obratovanja in stopnjo usposobljenosti, vendar sorazmerna s stopnjo obratovanja v drugih državah. Ugotovljeno je tudi bilo, da stopnja zaustavitve obratovanja in normalna stopnja usposobljenosti proizvodnje bistveno vplivata na energetsko intenzivnost procesa v smislu nihanja proizvodnje. Na podlagi ugotovitev so podani predlogi za zmanjšanje nihanja proizvodnega procesa. Model se lahko uporabi za kvantitativno analizo, ki opiše vpliv nihanja proizvodnje na intenzivnost energetske učinkovitosti procesa. S pomočjo analize se lahko sprejmejo ukrepi za zmanjšanje porabe energije, skupaj s prilagoditvijo načrtovanja proizvodnje, določitvijo strategije itd.

PODATKI O ČLANKU

Ključne besede:
Železarska in jeklarska industrija
Nihanje proizvodnje
Stanje proizvodnje
Stopnja obratovanja
Stopnja usposobljenosti
Energetska intenzivnost procesa

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Zgodovina članka:
Prejet 24. junija 2016
Popravljen 20. novembra 2016
Sprejet 31. decembra 2016