

热工自动控制

数据挖掘方法在实时厂级负荷优化分配中的应用

曾德良, 杨婷婷, 程晓, 刘吉臻

华北电力大学控制与计算机工程学院

摘要: 介绍一种解决实时厂级负荷优化分配问题的方法。通过大量的分析现场数据, 认为机组煤耗特性曲线不能进行回归和拟合, 而是一些离散点连接而成的曲线。在默认热力学计算准确的条件下, 分析了影响机组供电煤耗率的因素, 研究了基于信息熵的多因素权重分配方法, 结合海量历史数据相对准确地预测出各个工作点下的供电煤耗率, 从而建立负荷与供电煤耗率之间的实时离散模型, 采用动态规划法求得快速性和经济性约束条件下的全局最优解。该方法在大唐国际盘山电厂得到实际验证, 结果证明该方法准确、实用。

关键词: 厂级负荷优化分配 数据挖掘 供电煤耗率 动态规划法 全局最优解

Application of Data Mining Method in Real-time Optimal Load Dispatching of Power Plant

ZENG De-liang, YANG Ting-ting, CHENG Xiao, LIU Ji-zhen

School of Control and Computer Engineering, North China Electric Power University

Abstract: A solution to real-time optimal load dispatching problem of power plant was introduced in this paper. Based on analysis of operating data, it was proved that the characteristics curve of unit coal consumption rate (CCR) against load are constructed by discrete points and it can't be fit by linear regression. In the default condition of accurate thermodynamic calculation, factors impacting unit CCR for power supply are studied. Multi-factors weight distribution method based on information entropy was employed to predict CCR for power supply at different operating points based on history and real-time data. Thus, discrete mathematical model between load and CCR was build up for each unit. Based on the proposed speediness and economy constraints, global optimal solution for optimal load dispatching was approached by dynamic programming method. The method proposed in this paper was applied in Panshan power plant of China Datang Corporation and it was proved to be practical and effective.

Keywords: optimal load dispatching problem of power plant data mining coal consumption rate for power supply dynamic programming method global optimization

收稿日期 2009-04-14 修回日期 2009-09-08 网络版发布日期 2010-04-29

DOI:

基金项目:

国家863高技术基金项目(2007AA041105, 2007AA04Z163)。

通讯作者: 杨婷婷

作者简介:

作者Email:

参考文献:

本刊中的类似文章

1. 杨薛明 苑津莎 王剑峰 高鑫.基于云理论的配电网空间负荷预测方法研究[J]. 中国电机工程学报, 2006,26(6): 30-36
2. 蒋维勇 孙宏斌 张伯明 吴文传 王康.电力系统精细规则的研究[J]. 中国电机工程学报, 2009,29(4): 1-7

扩展功能

本文信息

- ▶ Supporting info
- ▶ PDF(OKB)
- ▶ [HTML全文]
- ▶ 参考文献[PDF]
- ▶ 参考文献

服务与反馈

- ▶ 把本文推荐给朋友
- ▶ 加入我的书架
- ▶ 加入引用管理器
- ▶ 引用本文
- ▶ Email Alert
- ▶ 文章反馈
- ▶ 浏览反馈信息

本文关键词相关文章

- ▶ 厂级负荷优化分配
- ▶ 数据挖掘
- ▶ 供电煤耗率
- ▶ 动态规划法
- ▶ 全局最优解

本文作者相关文章

- ▶ 曾德良
- ▶ 杨婷婷
- ▶ 程晓
- ▶ 刘吉臻

PubMed

- ▶ Article by Zeng,D.L
- ▶ Article by Yang,T.T
- ▶ Article by Cheng,x
- ▶ Article by Liu,J.Z

3. 王友 马晓茜 刘翱.自动发电控制下的火电厂厂级负荷优化分配[J]. 中国电机工程学报, 2008,28(14): 103-107
 4. 熊浩 李卫国 畅广辉 郭惠敏.模糊粗糙集理论在变压器故障诊断中的应用[J]. 中国电机工程学报, 2008,28(7): 141-147
 5. 牛成林 刘吉臻 马永光 李建强.基于增量数据挖掘的氧量最优值确定[J]. 中国电机工程学报, 2009,29(35): 29-34
 6. 郝祖龙 刘吉臻 常太华 田亮.基于小波变换的热工信号多尺度相关性分析[J]. 中国电机工程学报, 2010,30(14): 109-114
 7. 李再华 白晓民 周子冠 许婧 李晓珺 张霖 孟珺遐 朱宁辉.基于特征挖掘的电网故障诊断方法[J]. 中国电机工程学报, 2010,30(10): 16-22
-