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Operational behaviour of a clarifier system in the sugar industry using supplementary variable technique

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Published Online: October 11, 2018 · pp 365-386 · <https://doi.org/10.1504/IJISE.2018.095532>

ABOUT

Abstract

In this paper, the clarifier system in the sugar industry is analysed having three subsystems - raw juice heater, juice sulphitor and sulphited juice heater. These subsystems are arranged in series. Both the subsystems 'raw juice heater' and 'sulphited juice heater' have standby unit whereas subsystem 'juice sulphitor' has single unit. The time to failure of the subsystems follows negative exponential distribution while repair time distribution is taken as arbitrary. The differential-difference equations associated with the state changeover model are developed by using supplementary variable technique and these equations are solved to get state probabilities of the system model. A particular case is also considered to show the behaviour of availability and expected profit of the clarifier system in the sugar industry.

Keywords

availability, clarifier system, expected profit, sugar industry, supplementary variable technique

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