

ANALISIS LANJUT PERMASALAHAN EFEKTIVITAS DAN RELIABILITAS MESIN PENGGILING MENGGUNAKAN FAILURE MODE AND EFFECT ANALYSIS (FMEA) UNTUK MEREDUKSI SIX BIG LOSSES DI PG MADUKISMO

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INTISARI

Gula merupakan suatu karbohidrat sederhana yang menjadi sumber energi dan komoditi perdagangan utama dalam bentuk kristal. Konsumsi gula di Indonesia terus meningkat disebabkan oleh bertambahnya jumlah penduduk di Indonesia. Akan tetapi produksi gula nasional tidak dapat memenuhi kebutuhan konsumsi di Indonesia. Rata-rata pabrik gula di Indonesia merealisasikan produksi dibawah kapasitas produksi dikarenakan pabrik gula yang memproduksi dibawah kapasitas. Hal ini disebabkan oleh kurangnya bahan baku dan rendahnya efisiensi pabrik.

Proses produksi di PG Madukismo sering mengalami suatu masalah pada mesin-mesin yang terdapat di stasiun penggilingan yaitu terhambatnya proses produksi diakibatkan komponen mesin yang tiba-tiba tidak dapat berfungsi dan tekanan uap rendah. Untuk memperbaiki kondisi tersebut digunakan metode *Overall Equipment Effectiveness (OEE)*, *Mean Time Between Failure (MTBF)*, *Mean Time to Repair (MTTR)*, *Failure Mode and Effect Analysis (FMEA)*, dan *Six Big Losses*.

Dari hasil perhitungan yang telah dilakukan, diperoleh rata-rata nilai *Overall Equipment Effectiveness (OEE)* mesin di stasiun penggilingan yaitu sebesar 76,91%. Dari perhitungan *Mean Time Between Failure (MTBF)* dan *Mean Time to Repair (MTTR)* dapat diketahui nilai masing-masing yaitu 31,6 jam dan 2,6 jam. Komponen prioritas perbaikan berdasarkan FMEA adalah komponen yang memiliki nilai RPN diatas nilai RPN kritis dari masing-masing mesin. Pada mesin cane cutter yaitu listrik drop/padam, pada mesin unigrator yaitu mur dan baut putus dan pada mesin rol gilingan yaitu tekanan uap rendah yang disebabkan mesin boiler usang. Faktor kerugian (*six big losses*) pada mesin penggilingan yang paling mempengaruhi nilai OEE adalah idling & minor stoppages losses yaitu sebesar 20,3%.

Kata Kunci : Gula, *Overall Equipment Effectiveness (OEE)*, *Failure Mode and Effect Analysis (FMEA)*, MTBF dan MTTR, *Six Big Losses*

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FURTHER ANALYSIS OF THE ISSUE OF THE EFFECTIVENESS AND RELIABILITY OF GRINDER MACHINE USING FAILURE MODE AND EFFECT ANALYSIS (FMEA) FOR THE REDUCTION OF THE SIX BIG LOSSES IN PG MADUKISMO

ABSTRACT

Sugar is a simple carbohydrate that is a source of energy and major trade commodity in the form of crystals. Sugar consumption in Indonesia is on the rise is caused by the increase of the population in Indonesia. But the national sugar production can not meet the needs of consumption in Indonesia. The average sugar factory in Indonesia realize production under production capacity due to the sugar factory producing under capacity. This is caused by a lack of raw materials and low efficiency of the plant.

Production processes at Madukismo PG often experience a problem on machines in the grinding station like the production process obstructed caused the engine components that suddenly can't function and low vapor pressure. To improve the condition of the used method of Overall Equipment Effectiveness (OEE), Mean Time Between Failure (MTBF), Mean Time to Repair (MTTR), Failure Mode and Effect Analysis (FMEA), and Six Big Losses.

From the results of the calculations have been performed, the obtained average value of the Overall Equipment Effectiveness (OEE) machine in grinding stations namely of 76.91%. The calculation of Mean Time Between Failure (MTBF) and Mean Time to Repair (MTTR) can be known to the respective value is 31.6 hours and 2.6 hours. Component repair priorities based on FMEA are the components that have a value above the value of the RPN RPN criticality of each machine. Cane cutter machine, namely electric drop/outages, unigrator on a machine that is dotted and the nuts and bolts on the machine rollers grinder that is a low vapor pressure caused by boiler machine obsolete. Loss factor (the six big losses) on a milling machine that most influence the OEE value is minor stoppages idling & losses is amounted to 20.3%.

Keywords: Sugar, *Overall Equipment Effectiveness (OEE)*, *Failure Mode and Effect Analysis (FMEA)*, MTBF dan MTTR, *Six Big Losses*

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