

Analisis pengaruh renovasi struktur pabrik terhadap respon dinamik = Analysis of the effect from structural plant renovations against dynamic response

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Abstrak

Untuk meningkatkan kapasitas produksi, sebuah struktur pabrik direnovasi berupa penguatan komponen struktur yang sudah ada serta penambahan komponen struktur dan pondasi baru. Pada awalnya, struktur ini mengalami getaran akibat beban dinamik mesin flash gas bag filter, namun setelah direnovasi getaran tersebut menghilang. Melalui penelitian ini dikaji penyebab menghilangnya getaran tersebut dengan cara memodelkan struktur pabrik sebelum dan sesudah renovasi serta memodelkan beban mesin sebagai beban dinamik impuls. Pada permodelan beban gravitasi, urutan pembebanan pada struktur yang sudah ada maupun struktur yang sudah direnovasi ikut diperhitungkan. Dari hasil permodelan tersebut akan didapatkan rasio tegangan akibat beban mati pada struktur sebelum renovasi, dan rasio tegangan akibat kombinasi pembebanan pada struktur setelah direnovasi. Dan didapatkan juga nilai respon dinamik struktur yang berupa acceleration, displacement, dan velocity yang berkurang secara signifikan setelah direnovasi. Struktur pabrik sebelum direnovasi menunjukkan respon dinamik yang masuk dalam kategori uncomfortable berdasarkan standar internasional untuk skala getaran ketidaknyamanan. Namun, ketika struktur pabrik tersebut sudah direnovasi, respon dinamik yang didapatkan akan berada pada kategori not uncomfortable.

To increase production capacity, a renovated plant structure components such as retrofitting existing structures and structural components as well as the addition of a new foundation. At first, these structures undergo the vibration due to dynamic loads from flash gas bag filter engine, but after the renovation the vibration disappears. Through this study examined the causes of the disappearance of the vibration by way of modeling plant structure before and after the renovation as well as modeling the engine load as 1 dynamic impulse load. In the gravity load modeling, the sequence of loading on existing structures or structures that have been renovated are considered. From the modeling results will be obtained due to the dead load stress ratio on the structure before the renovation, and the ratio of stress due to the combination of loading on the structure after being renovated. And also the value obtained in the form of structural dynamic response acceleration, displacement, and velocity were reduced significantly after the renovation. Plant structure before it was renovated structure shows that the dynamic response in the category uncomfortable based on international standards for vibration-scale inconvenience. However, when the structure of the plant has been renovated, the dynamic response will be obtained in the category of not uncomfortable.