

# Pengembangan teknik pemeliharaan terintegrasi berbasis keandalan, risiko dan kondisi untuk peningkatan ketersediaan pembangkit tenaga listrik termal = Development of integrated maintenance techniques based on reliability risk and condition for availability improvement of thermal power plants

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## Abstrak

### <b>ABSTRAK</b><br>

Ketersediaan sistem pembangkit tenaga listrik dipengaruhi oleh keandalan suku cadang dan manajemen pemeliharaan yang berdampak pada maintainability. RCM Reliability Centered Maintenance , RBM Risk Based Maintenance , dan CBM Condition Based Maintenance atau gabungan RCM dan RBM, atau RCM dan CBM telah diterapkan pada pembangkit tenaga listrik. Setiap teknik pemeliharaan menghasilkan maintenance work packages. Implementasi RCM, RBM dan CBM secara terintegrasi akan menghasilkan maintenance work packages yang akan meningkatkan ketersediaan pembangkit listrik lebih signifikan dibandingkan penggunaan masing-masing teknik pemeliharaan atau gabungan dua teknik pemeliharaan. Penelitian ini mengintegrasikan teknik pemeliharaan berbasis keandalan, risiko dan kondisi yang disebut Teknik Pemeliharaan Terintegrasi TPT . Tahapan TPT sebagai berikut: menentukan pohon fungsi, rekaman data kerusakan, FMEA Failure Mode Effect Analysis , FTA Fault Tree Analysis , risk analysis, yang kemudian menghasilkan MPI Maintenance Prioritization Index , FDT Failure Defense Task , integrated maintenance program yang dilakukan condition monitoring assessment, analisis keandalan maintainability dan hasil. Dalam penelitian ini dikembangkan model matematis, dan dilakukan simulasi untuk menganalisis ketersediaan yang dihasilkan teknik pemeliharaan. Tingkat ketersediaan RCM, RBM, CBM dan TPT sebagai berikut 81,56 , 81,02 , 84,92 , dan 90,07 . Penerapan TPT pada PLTU objek penelitian telah menghasilkan peningkatan ketersediaan dari 76,95 2008 ndash; 2012 atau 81,84 2010 ndash; 2012 menjadi 92,59 2013 ndash; Mei 2015 .

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### <b>ABSTRACT</b><br>

Availability of thermal power plant is influenced by the reliability of spare parts and maintenance management that affect maintainability. RCM Reliability Centered Maintenance , RBM Risk Based Maintenance , and CBM Condition Based Maintenance or combined RCM and RBM or RCM and CBM have been applied in thermal power. Each maintenance technique will generate each maintenance work packages. Implementation of RCM, RBM and CBM maintenance techniques in an integrated manner will result in maintenance work packages that will increase the availability of power plants more significantly than the use of each maintenance technique or a combination of two maintenance techniques. This research integrates maintenance techniques based on reliability, risks and conditions, called Integrated Maintenance Techniques TPT , which consists of 10 steps determining function tree, operation records, FMEA Failure Mode Effect Analysis , FTA Fault Tree Analysis , risk analysis, which then produce MPI Maintenance Prioritization Index , FDT Failure Defense Task , integrated maintenance program conducted by condition monitoring assessment, reliability maintainability analysis and results. This research developed a

mathematical model, and then performed a simulation to analyze the availability produced by each maintenance technique. Availability of RCM, RBM, CBM and TPT is as follows 81.56 , 81.02 , 84.92 , and 90.07 . The implementation of TPT in thermal power plant of research object has resulted in an increase of thermal power plant availability from 76.95 2008 2012 or 81.84 2010 2012 to 92.59 2013 May 2015 .