

**TOUR AND BREAK SCHEDULING FOR SHIFT OPERATORS IN HARD DISK  
DRIVE MANUFACTURER**

**A THESIS**

**Submitted in Partial Fulfillment of the Requirement for the Bachelor Degree  
of Engineering in Industrial Engineering**



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**IDENTIFICATION PAGE**

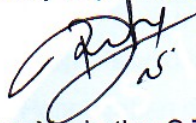
**A THESIS ON  
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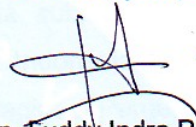
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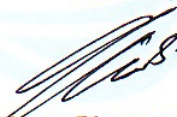
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## DECLARATION OF ORIGINALITY

I certify that the research entitled "Tour and Break Scheduling for Shift Operators in Hard Disk Drive Manufacturer" in this thesis has not been submitted for any other degree.

I certify that to the best of my knowledge and belief, this thesis which I wrote does not contain the works of parts of the works of other people, except those cited in the quotations and bibliography, as a scientific paper should.

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## ABSTRACT

The thesis entitled “Tour and Break Scheduling for Shift Operators in Hard Disk Drive Manufacturer” began with problem identification based on current condition of shift operator’s schedule in Hard Disk Drive manufacturer. The schedules considered were break schedule and work pattern. It was revealed that break schedule violates regulation from Thailand’s Ministry of Labor, and work pattern violates regulation from Apple, and EICC. According to literature review, mostly previous researches on any scheduling types considered work pattern but only one research from Rekik et al. (2010) considered multiple break in shift scheduling problem. But, there was no paper considering the combination between work pattern and break scheduling. Thus, the contribution of this research was application of tour scheduling for combination between work pattern and shift type and application of break scheduling for multiple breaks in one shift. The objective in this research was proposing new break schedule to fulfill Thailand’s Ministry of Labor and work pattern to fulfill Apple and EICC by creating program on Microsoft Excel.

To fulfill all regulations, both break schedule and work pattern were developed by generating algorithm, building VB program on Microsoft Excel, and analyzing the result. The program built for both break schedule and work pattern acted as calculator because some input data could not fulfill all criteria created in the program. Break schedule was developed first as output of break schedule became one of input on developing work pattern.

Both the best result from break schedule and work pattern could fulfill all regulations. The best break schedule had 90 minutes total break with 45 minutes each respectively. The schedule could assign one stagger team to handle 6 line teams. Following total break from the best break schedule, the best work pattern was 4 consecutive work days and 2 consecutive off days with 6 days of work cycle. Value of workweek on the best work pattern was 42 hours per work cycle. Since all crews has same work pattern, combination of assignment for all crews regarding with shift work named shift schedule was generated. Placement of first work day on work cycle between each crew on work pattern was 2 days. Thus, the first work day between day and night shift on shift schedule differed 2 days.

**Keywords :** Hard Disk Drive manufacturer, shift operators, break schedule, work pattern, Thailand’s Ministry of Labor, EICC, Apple, tour scheduling, break scheduling, VB program, shift schedule.