

The effect of coal hauling cycle time recording construction essay

[Business](#), [Industries](#)



This chapter is illustrated the issues involved in the procedure of execution, Coal Hauling Cycle Time Recording (CHCTR) . The research will indicate out the important expected result benefit which occurs after execution the system such as cost benefit analysis, cycle-time decrease, and minimized hazard of human mistake from coal haling dealing study. Furthermore, it provides the consequence and analysis of the success standards and success factor in the execution. 4. 1 Issue involved in the procedure During the execution, there are some issues involved in the procedure as follows: The hold clip of web communicating From Coal Hauling Cycle Layout Area, is divided the local country web for TCM in to two countries by utilizing satellite communicating. Presently, both webs join together with a span web by utilizing high wireless frequence so it has an impact on the hold clip in application.

Furthermore, if one of the webs is failed so the path of transit information from mine stock pace to port stock pace will be hard to acquire entree. Therefore, it will hold an impact on the public presentation study in order to analyse and foretell the production program. Figure 4. 1: Local Area Network at MSY and PSY The information collected is inconsistent Due to the design of GPS tracking log, it will utilize the truck driver to manually press the activities such as burden, weight, draw, downtime, waiting, etc. during the coal trucking as figure 4.

2. Then, if the driver can non treat wholly the informations will non be efficiency to measure the public presentation of contractors. Furthermore, the contractors will non cognize the troubleshooting information which

occurs to their vehicles such as engines, transmittal, hydraulic, Sur, or etc. Beginning: GPS tracking log manual Figure 4. 2 Procedure trucking Role and duty of undertaking Figure 4. 3: Undertaking direction stages compared to the System Development Life Cycle Role and duty of undertaking is ill-defined so it has an impact on close-out stage. Harmonizing to the undertaking induction base on self-organized squad so individual who involve need support from their direction squad.

4.

2 Expected result benefit

GPS tracking log and CHCTR database and application were designed by trim equipment for iterative development which is the right for house ' s mine operation. Those characteristics were considered by many restriction and demand from the house. Then, the system will be difficult to happen in the market but if there is, the monetary value will be higher than CHCTR.

Therefore, the improving of engineering will derive benefit for the house as scenario on below.

4. 2. 1 Safety

From the safety coverage of truck driver for monitoring and controlling, the critical place that the house would wish to mensurate speed is Km. 7+500, Km. 19+600, Km.

19+700, Km. 22+500, Km. 24+500, Km. 26+000, and Km. 34+500. The consequence of velocity will stand for the consequence from CHCTR which occur to driver behaviour. Figure 4. 4: The critical place at coal haling

The incident hauling route study from twelvemonth 2008-year Jun 2010 showed the disbursal as follows: Year 2008: No disbursal from incident Year 2009: USD 510, 000 Jun twelvemonth 2010: USD 131, 432 From the incident hauling route study from twelvemonth 2008 and twelvemonth 2010, the consequence showed that Km.

26+000 and Km. 24+500 had incident so it might be the status of route or driver. If the house creates the scenario to better hauling route, it will be cut down the incident and increase productiveness.

From the rhythm clip public presentation and use of hauling truck represent mean normal rhythm clip for one trip is approx 156 minutes⁶ and mean day-to-day production is approx 20, 000 ton/ twenty-four hours. Furthermore, the changeless information will follow by coal monetary value in fury of USD 60-757, working twenty-four hours 300/year, working hr 20 hr/day, mean hauling truck capacity 60 ton/unit, entire fleet of coal hauling 30 units, and coal excavation operation cost in scope of USD 8-188. Scenario: Re-grade or Re-Slope length from Km. 26+000 and Km. 24+500 for 1. 5 Km.

Figure 4. 5: Cross-Section of Coal Hauling Road Presently mean up-hill velocity of truck capacity 60 ton/unit is 25 Km. /hr after improved by cut downing the class of draw route. It will increase the mean up-hill velocity to be 45 Km./ hour.

so the increasing velocity will be 20 Km./hr. Therefore, the rhythm clip of trucking will be reduced for 4. 5 min.

Daily haling trip: $(20\text{hr/day} * 60\text{ min.}) / (156\text{ min.}) = 7.69$

Improved day-to-day haling trip: $(20\text{hr/day} * 60\text{ min.}) / (156 - 4.5\text{ min.}) = 7.92$ trips/ day/ truck
Incremental trip: $(7.92 - 7.69) = 0.23$ trip/ day/ truck

Incremental haling truck capacity: $(0.23\text{ trip/day/truck} * 30\text{ units} * 60\text{ ton/day/unit}) = 414\text{ ton/ twenty-four hours}$
Average coal monetary value is USD 67.5 and mean coal excavation operation cost is USD 13. Estimate mean coal haling cost is 30 % of coal excavation operation cost, USD 4/ ton. If the contractors can cut down their velocity clip, it might impact the coal haling cost for 2.

88 % so the cost will be decreased for USD 0.12/ ton. Estimate added gross: $(414\text{ ton/day} * \text{USD } 0.12 * 300\text{ day/year}) = \text{USD } 14,904/\text{ year}^*$

4.2.

2 Cycle-time decrease

Cycle-time decrease purposes to better and place unsought activities and waste clip. From the rhythm clip public presentation and use of haling truck represent mean normal rhythm clip for one trip is approx 156 minutes⁶ and mean day-to-day production is approx 20,000 ton/ twenty-four hours.

Furthermore, the changeless information will follow by coal monetary value in fury of USD 60-757, working twenty-four hours 300/year, working hr 20 hr/day, mean hauling truck capacity 60 ton/unit, entire fleet of coal haling 30 units, and coal excavation operation cost in scope of USD 8-188. Figure 4.6: The rhythm clip public presentation and use of haling truck

Expected return for “ Scenario I ”

Figure 4. 7: Scenario I(a) Reduce clip at oppressing works for 3 min. by cut downing for 1 min. at lading country and 2 min.

at oppressing works readying.(B) Reduce clip at coal haling route for 4 min. by cut downing for 3 min. along coal trucking and 1 min.

at Kaju station.(degree Celsius) Reduce clip at port activities for 3 min. by cut downing for 2 min. at larboard readying and 1 min. at dispatching.

Entire rhythm clip decrease is 10 min. or 6. 4 %Daily haling trip: (20hr/day * 60 min.) / (156 min.) = 7.

69 trips/ day/ truckImproved day-to-day haling trip: (20hr/day * 60 min.) / (156-10 min.) = 8. 22 trips/ day/ truckIncremental trip: (8. 22 - 7. 69) = 0. 53 trip/ day/ truckIncremental haling truck capacity: (0.

53 trip/ day/truck * 30 units * 60 ton/day/unit) = 954 ton/ twenty-four hoursAverage coal monetary value is USD 67. 5 and mean coal excavation operation cost is USD 13. Estimate mean coal haling cost is 30 % of coal excavation operation cost, USD 4/ ton. If the contractors can cut down their idle clip, it might impact the coal haling cost for 6. 4 % so the cost will be decreased for USD 0. 26/ ton.

Estimate added gross: (954 ton/day * USD 0. 26* 300 day/year) = USD 74, 412/ twelvemonth

Expected return for “ Scenario II ”

Figure 4. 8: Scenario II(a) Reduce clip at oppressing works for 3 min.

by cut downing for 1 min. at lading country and 2 min. at oppressing works readying.(B) Reduce clip at coal haling route for 4 min. by cut downing for 3 min.

along coal trucking and 1 min. at Kaju station.(degree Celsius) Reduce clip at port activities for 3 min. by cut downing for 2 min. at larboard readying and 1 min. at dispatching.(vitamin D) Reduce clip at truck graduated table for 1 min. Entire rhythm clip decrease is 11 min.

or 7. 1 %Daily haling trip: $(20\text{hr/day} * 60 \text{ min.}) / (156 \text{ min.}) = 7. 69 \text{ trips/ day/ truck}$
Improved day-to-day haling trip: $(20\text{hr/day} * 60 \text{ min.}) / (156-11 \text{ min.})$

$= 8. 28 \text{ trips/ day/ truck}$
Incremental trip: $(8. 28 - 7. 69) = 0. 59 \text{ trip/ day/ truck}$
Incremental haling truck capacity: $(0. 59\text{trip/day/truck} * 30 \text{ units} * 60 \text{ ton/day/unit}) = 1, 062 \text{ ton/ twenty-four hours}$
Average coal monetary value is USD 67. 5 and mean coal excavation operation cost is USD 13.

Estimate mean coal haling cost is 30 % of coal excavation operation cost, USD 4/ ton. If the contractors can cut down their idle clip, it might impact the coal haling cost for 7. 1 % so the cost will be decreased for USD 0. 28/ ton.

Estimate added gross: $(1, 062 \text{ ton/day} * \text{USD } 0. 28 * 300 \text{ day/year}) = \text{USD } 89, 208/ \text{twelvemonth}$

4. 2.

3 Minimized hazard of human mistake

The bettering contractor ' s public presentation rating method will diminish the human mistake which occurs from speed-gun measuring and key in manually. Furthermore, the staffs who work in this place can make other occupations that create more value to the house. For illustration the speed-gun operator will be USD 230/month and input informations decision maker will be USD 200/month. If the house creates scenario to salvage the chances cost for 10 % per month, it will cut down the disbursal for USD 43.

4. 2.

4 Cost benefit analysis

The entire investing cost of CHCTR is USD 144, 000
 Accident compensation cost is USD 14, 904/ year
 *Scenario I: Salvaging buffer infinite compensation is USD 74, 412/ twelvemonth
 Scenario II: Salvaging buffer infinite compensation is USD 89, 208/ twelvemonth
 Labor cost economy is USD 516/ twelvemonth
 Depreciation for 4 old ages
 Discount rate is 11 %
 ROI for Scenario I in twelvemonth 1: $[((14, 904 + 74, 412 + 516) - 144, 000) / (144, 000)] * 100 = -37. 62 \%$
 The breakeven point of Scenario I in twelvemonth 2
 NPV = 23, 010. 86
 IRR = 18 %
 ROI for Scenario II in twelvemonth 1: $[((14, 904 + 89, 208 + 516) - 144, 000) / (144, 000)] * 100 = -27. 34 \%$
 The breakeven point of Scenario II in twelvemonth 2
 NPV = 68, 914. 64
 IRR = 32 %
 Therefore, the CHCTR will be an efficiency of operational measuring in order to increase haling production as the cost benefit analysis.

4.3 Critical success factor

Critical success factors can be classified into two groups which affect undertaking public presentations at different stages of execution. The first group is referred to as the strategic group that consists of factors like undertaking mission, top direction support, and undertaking programming. The other group is the tactical group, which consists of factors like client adviser and personal choice and preparation (Schultz et al., 1987). From the secondary information of Critical Success Factors in the Real-time Monitoring of Construction Projects¹⁰ by K.

Divakar and K. Subramanian showed that Linear Multiple Regression of these factors with the dependent factor Frequent Changes in programs, designs and working drawings, revealed that the implicit factor Role of Project Participants was said to hold a more cause and consequence on the dependent variable Cash flow in the undertaking at all degrees right from the client to site applied scientist. The sum-up of the arrested development with coefficients for the arrested development theoretical account is shown as follows: Figure 4.9: Coefficients for arrested development theoretical account

A arrested development theoretical account equation which is non-functional equation but a cause and consequence theoretical account was written as follows: Cash flow in the undertaking at all degrees right from the client to site applied scientist = 0.890 (Role of Project Participants) + 0.522 (invariable)

The initial factors which are included under the implicit factor Role of Project Participant are (a) Engagement and committedness of undertaking participants – clients, advisers, and contractors (B) Engagement

and committedness of undertaking directors, undertaking applied scientists, proficient helpers, and workers(degree Celsius) Delay in finalisation of public-service corporation or alteration in the public-service corporation(vitamin D) Periodic treatment among project participants and timely bringing of the result or feedback(vitamin E) Coordination between bureaus involved in the undertaking(degree Fahrenheit) Controversies among project participants and hence suspension of work(g) Preparation of Bill of Quantities and timely payment to contractorsTherefore, the function of undertaking participant is critical in this respect. The critical factors identified in the analysis above should be monitored by the undertaking directors. The undertaking director should liaison between the clients, advisers and the undertaking applied scientists.

At the programming phase the factors should be given due considerations. During the advancement of the work the monitoring of the undertaking should be done with particular attending to these factors as these are the factors which causes hold if non monitored at the appropriate phases. So effectual monitoring of the critical factors identified in this survey will guarantee successful completion of the undertaking.

4. 4 SWOT technological achieve fight

Figure 4. 9 SwotThe analysis of GPS Guidance System suggests that such system may hold important impact on direction of earth-moving equipment and at truth of mining operations. The wage back period may change depending on the clip and resources put into the system to recognize, it is full potency either straight or indirectly. The ideal environment for the

installing of a GPS counsel system would be in a mine with a long life (& gt ; 1 twelvemonth) .

This manner the payback of the system would be ensured and the benefits and cost nest eggs could be realized for longer.

Notes:

6: Average rhythm clip for one trip as appendix II7: Beginning Jakarta Post March, 30 20108: Beginning of Indonesia commercial newssheet9: Premise of WACC in mean excavation industry as appendix III10: Descriptive statistics identified 19 factors ; the responses received tungsten ere in the signifier of evaluations on a 4 point Lickert Scale. They are: 1. No Effect, 2. Fringy Effect (where hold caused can be to the full revived) , 3. Significant Effect where the hold caused can be partly revived) , 4.

Adverse Effect (where hold caused is beyond resurgence) . The consequence was showed as appendix IV* : Road alteration building has to be trade-off between cost and return.

Appendix:

Appendix IIBeginning: Coal Hauling Cycle Time Recording execution studyAppendix IIIReturning to our illustration, allow ' s suppose has a capital construction of 40 % debt and 60 % equity, with a revenue enhancement rate of 30 % . The adoption rate (R_d) A on the company ' s debt is 5 % . A The riskless rate (R_f) is 5 % , the beta is 1.

3 and the hazard premium (R_p) is 8 % . The WACC comes to 10. 64 % .

So, rounded up to the nearest per centum, the price reduction rate for the norm excavation company is

WACC for the mean excavation industry

Cost of Debt

Cost of Equity

$$0.40 [R_d \times (1 - .30)] + 0.40 [5.0 \times 0.7] + 0.40 [3.5] + 1.40$$

WACC

AAAA Rounded WACC

$$0.60 [R_F + B (R_P)] + 0.60 [5.0 + 1.3 (8)] + 0.60 [15.4] = 9.24 = 10.64 \%$$

11 %

Appendix IV