From the calculated quantities it is estimated that if the requirement of reliability is 90% for E1-LHD1, then the PM schedule should be conducted at a frequency of every 38 hours. Similarly, for E2-LHD2, E3-LHD3, E5-LHD5 and E6-LHD6 the durations are 56 hours, 23 hours, 27 hours and 20 hours respectively.

Table 6. Reliability based PM time intervals for LHDs

Reliability Level	**Preventive Maintenance Time Interval, Hrs**				
	E1-LHD1	**E2-LHD2**	**E3-LHD3**	**E5-LHD5**	**E6-LHD6**
0.90	38	56	23	27	20
0.85	50	72	40	30	40
0.80	62	87	54	32	55
0.75	73	100	65	36	68
0.70	84	114	76	40	79

6. CONCLUSION

Continuous operation of equipment with a minor failures can only be possible by organizing the proper maintenance planning and implementation. Highest equipment availability and its effective utilization are the two important factors to improve the reliability. Reliability of LHDs was calculated with 3- parameter Weibull distribution analysis. The empirical approximation of this distribution was derived to identify the relations of PDF, CDF, FR and reliability. Weibull distribution parameters such as scale, shape and location parameters were estimated with respect to failure and repair data set. It was observed that the lowest level of reliability was associated with SSEl (8.33%) and SSM (20.24 %) in most of the LHDs (Table 5). It was concluded that unexpected breakdowns and its consequent idle times of the machine are the major causes for reduction in overall equipment performance. Computation of reliability based PM schedules, aids in designing and implementing a maintenance strategy that would potentially increase/enlarge the expected life of the machine. From the results it was observed that in order to achieve the maximum level of reliability i.e., 90%, effective preventive maintenance is necessary for every 38 hrs for E1-LHD1; for E2-LHD2 this could be 56 hours; E3-LHD3 for this could be 23 hours etc (Table 6). In this study overall equipment performance of the LHDs was not considered and performance evaluation was based only on availability and utilization calculations. Future research should include measurement of key performance indicators (KPI).

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