

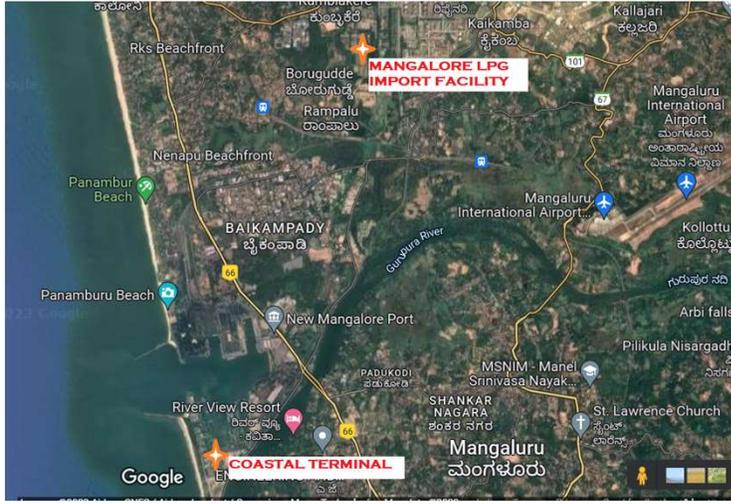


1



MLIF





- MLIF is the single largest LPG Import Facility in the entire country handling approx. 3 MMTPA.
- MLIF is spread over approx. 170 acres and catering to southern, western and central India.

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विद्युत्तमः सौमित्रिणः

MLIF OPERATIONS



your friendly gas

Receipt of Bulk LPG:

- IMPORT Receipts : 8 TMT/day
- MRPL Receipts : 3.5 TMT/day

Dispatches:

- Road Bulk Dispatches : 150-200 TTs / day
- Rail Bulk dispatches : 45-50 Rakes in a Month
- Pipeline Transfer (MDS) : 5500 MT / day
- Pipeline Transfer (MLBP, BPCL) : 1200 MT / day





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RAKE LOADING



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- The transportation of LPG is a critical process that requires careful planning, monitoring, and management.
- Intra nation transfer of LPG through Tank wagons is the second best mode of dispatch of LPG due to the following advantages.
 - Bulk transportation
 - Time efficient - eliminates multiple trips
 - Environment friendly - lesser carbon footprint
 - Prevents traffic congestion on road
 - Safe and secure
 - Reduced risk of accidents
- Hence, Railway sidings are being provided in the LPG plants/terminals wherever feasible.



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TRADITIONAL LOADING OPERATION



DIP CHECKING METHOD



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TRADITIONAL LOADING OPERATION



THROUGH DIPS

- Typical wagon loading operations involve loading of wagons from the top by making connections to the wagon valves through the Gantry loading arms.
- The quantity being filled is absolutely critical and under no circumstance the carrying capacity in terms of weight can be exceeded.
- The quantity to be filled is arrived by taking the density of the product and converting it to dips by the calibration charts available for the wagons.
- This requires deployment of experienced personal for filling the rail wagons to the actual capacity and involves high degree of human intervention for continuous monitoring of the filling operation.
- Once the wagons are filled, the valves are closed manually by maintaining close co-ordination with the pump operator.

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PROBLEM STATEMENT



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- Though the loading process is completed through manual checking of dips, the actual quantity filled can be ascertained by taking the weight at the in motion weigh bridge only.
- If excess quantity is detected at the weigh bridge for a particular wagon, the same once again needs to be placed at the gantry for unloading of the excess quantity.
- Placing of the overfilled wagon back at the gantry involves breaking of the entire rake into batches as desired by engaging locomotive.
- The process of decanting doesn't just add to the scope 3 emissions over usage of locomotive but also involves wastage of energy as high motor rating compressors have to be operated for decanting resulting in increased energy consumption.

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PROBLEM STATEMENT



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- Since overfilling is a major safety hazard, the same is not allowed at any circumstance.
- To avoid the process of rework, operators tend to have an exaggerated tolerance and try to fill only upto 93-94% of the CC quantity.
- This practice of having a bloated factor of safety is in vogue at all the rake loading locations thus negating the advantage of rake loading by dispatching less quantity than desired. The flipside of which is added scope 3 emissions.
- As the rakes are operating with underutilized carrying capacity, effectively one additional trip is being made by every rake after 20-25 trips which not just results in increased emissions but also a national loss.
- To address this predicament of avoiding rework/safety getting hampered during loading through under utilisation of carrying capacity, HPCL MLIF has come up with an innovative solution and implemented the same by automating the entire operations.

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AUTOMATED LOADING





METERING SKID



BATCH CONTROLLER UNIT

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AUTOMATED LOADING



- The automation software communicates with the In-motion weigh bridge, Wagon database, Batch controller unit, Digital control valve and Shut down valve.
- When the wagon arrives on the weigh bridge, the concerned wagon No. and the initial weight is fed to the software which then arrives on the quantity to be loaded based on the CC quantity available in the database.
- The data on quantity to be loaded flows from the software to the Batch controller units with a marginal safety factor which is less than 20% of the earlier tolerance levels.
- The BCUs automatically control the DCVs and SDVs and sequentially start the loading operation.
- Feedback from the Mass flow meters is continuously sent to BCU, which inturn triggers the closing of DCVs and SDVs after the preset is achieved.
- The entire project is automated and hence nullifies the hazard of overfilling whatsoever.

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ADVANTAGES OF AUTOMATION



- With automation we have been able to achieve the following:
 - Efficient utilization of CC quantity - We are able to load 98% of the CC as compared to 94% which is resulting in a saving of 1 trip for every 25 rakes being loaded.
 - The reduction of trips is yielding to lesser carbon emissions.
 - The absence of overfilling means no power consumption towards re-placement of the wagons for decanting and running of high power compressors thus saving energy and contributing to lesser emissions.
 - The entire operation being automated makes minimal human involvement, thereby reducing the human errors and enhanced safety in the overall operation.
 - Faster loading rates increasing the operational efficiency and lesser manpower required for the loading operation as well.

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SAVINGS IN FREIGHT



Apr-21						Apr-22							
S No	TW PLACED	CC QTY	WB QTY	RR AMOUNT	Actual Freight as per % Loading	Freight Loss	DATE OF LOADING	TW PLACED	CC QTY	WB QTY	RR AMOUNT	Actual Freight as per % Loading	Freight Loss
1	29	1090.400	1034.920	₹ 25,29,278.00	₹ 24,00,587.30	₹ 1,28,690.70							
2	30	1128.100	1071.200	₹ 11,83,854.00	₹ 11,24,141.84	₹ 59,712.16							
3	31	1165.300	1115.360	₹ 12,22,893.00	₹ 11,70,484.80	₹ 52,408.20							
4	30	1128.300	1078.940	₹ 11,84,064.00	₹ 11,32,264.48	₹ 51,799.52							
5	30	1128.100	1074.160	₹ 11,83,854.00	₹ 11,27,248.13	₹ 56,605.87							
6	32	1203.400	1114.580	₹ 20,65,129.00	₹ 19,12,706.90	₹ 1,52,422.10							
7	30	1127.700	1058.120	₹ 26,15,798.00	₹ 24,54,401.15	₹ 1,61,396.85							
8	32	1203.200	1150.700	₹ 12,62,666.00	₹ 12,07,571.28	₹ 55,094.72							
9	32	1203.500	1151.340	₹ 27,91,623.00	₹ 26,70,623.34	₹ 1,20,999.66							
10	32	1203.300	1142.420	₹ 12,62,771.00	₹ 11,98,882.11	₹ 63,888.89							
11	32	1203.400	1114.100	₹ 20,65,129.00	₹ 19,11,883.18	₹ 1,53,245.82							
12	32	1202.900	1142.380	₹ 12,62,351.00	₹ 11,98,839.92	₹ 63,511.08							
13	32	1203.300	1152.920	₹ 27,91,160.00	₹ 26,74,299.17	₹ 1,16,860.83							
14	31	1165.600	1134.360	₹ 12,23,207.00	₹ 11,90,423.04	₹ 32,783.96							
15	32	1203.500	1146.000	₹ 27,91,623.00	₹ 26,58,246.75	₹ 1,33,376.25							
16	32	1202.900	1152.740	₹ 12,62,351.00	₹ 12,09,711.94	₹ 52,639.06							
17	32	1203.200	1135.040	₹ 20,64,786.00	₹ 19,82,139.65	₹ 82,646.35							
18	31	1165.600	1096.880	₹ 12,23,207.00	₹ 11,51,090.68	₹ 72,116.32							
19	32	1203.500	1146.460	₹ 12,62,981.00	₹ 12,03,121.89	₹ 59,859.11							
20	32	1203.300	1161.62	₹ 12,62,771.00	₹ 12,19,031.04	₹ 43,739.96							
21	32	1203.200	1090.760	₹ 12,62,666.00	₹ 11,34,174.62	₹ 1,28,491.38							
22	32	1202.900	1113.960	₹ 12,62,351.00	₹ 11,69,015.31	₹ 93,335.69							
23	32	1203.200	1163.440	₹ 27,90,928.00	₹ 26,98,704.19	₹ 92,223.81							
24	32	1203.500	1151.480	₹ 12,62,981.00	₹ 12,08,390.00	₹ 54,591.00							
25	32	1203.200	1125.220	₹ 27,90,928.00	₹ 26,10,046.55	₹ 1,80,881.45							
26	32	1204.700	1162.700	₹ 18,10,541.00	₹ 17,47,419.29	₹ 63,121.71							
27	32	1209.400	1161.740	₹ 18,17,604.00	₹ 17,45,975.91	₹ 71,628.09							
28	32	1204.700	1152.760	₹ 18,10,541.00	₹ 17,32,480.49	₹ 8,060.51							
29	32	1209.400	1140.660	₹ 18,17,604.00	₹ 17,14,294.84	₹ 1,03,309.16							
30	32	1204.700	1158.180	₹ 18,10,541.00	₹ 17,40,626.19	₹ 69,914.81							
31	32	1209.400	1140.420	₹ 18,17,604.00	₹ 17,13,934.14	₹ 1,03,669.86							
32	32	1204.700	1142.040	₹ 18,10,541.00	₹ 17,16,369.42	₹ 94,171.58							
33	32	1209.400	1141.080	₹ 18,17,604.00	₹ 17,14,926.06	₹ 1,02,677.94							
34	32	1204.700	1163.960	₹ 18,10,541.00	₹ 17,48,711.78	₹ 61,829.22							
35	32	1209.400	1122.580	₹ 18,17,604.00	₹ 16,87,122.46	₹ 1,30,481.54							
36	1106	41625.000	39514.820	62022075.0	58879896.8	3142178.2							
37													
38													

TAS Saving Calculation			
Avg Freight Loss/Wagon April 21	Avg Freight Loss/Wagon April 22	Saving/Wagon	
3467.09	2148.26	1318.83	9.06 Lacs
1996.98	2050.95	-53.97	-0.27 Lacs
Total Saving in April-22			8.79 Lacs

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FY 2022-23		
S No	MONTH	SAVINGS IN FRIEGHT (IN LAKHS)
1	APRIL	8.79
2	MAY	13.12
3	JUNE	2.86
4	JULY	1.06
5	AUGUST	6.74
6	SEPTEMBER	14.49
7	OCTOBER	16.54
8	NOVEMBER	7.87
9	DECEMBER	11.64
10	JANUARY	14.61
11	FEBRUARY	11.97
12	MARCH	17.21
TOTAL		126.9

- The project has yielded a savings of 127 lakhs in the last financial year alone.
- Without considering the savings on manpower front for operation, the additional energy savings against rework and the increased operational efficiency, the entire project cost of 637 lakhs gets payed back within the span of 5 years.

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Carbon emissions				
S No	Avg % loaded in 21-22	Avg % loaded in 22-23	Additional utilization per wagon (Tons)	Additional quantity being filled per rake (Tons)
1	94	98	1.504	48.128

- With increasing environmental concerns around, we at HPCL MLIF are not just putting efforts to reduce the scope I and II emissions, but are cutting short the Scope III emissions by decarbonizing the supply chain.
- With increase the filling efficiency, we are able to load around 50 MT of LPG more per Rake. Thus we are able to save one trip for every dispatch of 25 rakes.

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CARBON EMISSIONS



your friendly gas

Product dispatched through rake in a FY (MT)	Trips required without automation	Trips taken with automation	Total trips saved	Quantity in each rake
612000	541	519	22	1179.136

Destination	Distance	No. of rakes dispatched	Rail green points gained
CHPH	1033	51	1989
DKN	473	238	4284
HWD	783	244	7320
		Total	13593
Avg Dist	1336.994		
KM saved	29413.88		
GHG factor	0.00996	KgCO ₂ e/Ton-Km	
Carbon emissions saved	345.4423	Tons of CO₂e	

- For the product being handled at MLIF, we are thereby able to save 22 trips (29414 Km) in total through the project.
- Apart from the 13600 Rail green points already being earned by choosing to dispatch through Rail, taking the India GHG factor of 0.00996 KgCO₂e/Ton-Km for rail, we are able to save an additional of approx. 350 Tons of Scope III CO₂ emissions into the environment.

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Thank you!

Safety Brings Smiles !!!

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