



PT SEMEN PADANG

Compressed Air Leak Survey, Leaks Repair and Staff Campaign

SUMMARY OF THE OPTION

PT Semen Padang produces 5,240,000 tons of cement per year using five plants, of which one is not operational anymore. The GERIAP project focused on Indarung IV. This was used to study the compressed air leaks and repair leaks. Based on the assumption that old installations have a lot of leakages, a leak survey was done to check the amount of leakage points for three compressors, the kiln room compressors (J3K32 & J3K34) and one compressor in cement mill (GA 90). The first step was to check leaks in the piping installation. The survey found 23 leakage points. The second step was to note the loading & unloading of the compressors and the third step was to repair the leaks found in the survey. The fourth step was to follow up with the loading & unloading after the leak repair. The result shows the differences in J3K32 to be 9.32 %, J3K34 to be 9.15 % and GA90 to be 7.81 %. The differences in loading were used to calculate energy savings which were found to total 93,277 kWh/year or its equivalent of US\$ 5,306 per year and reductions of 68 tons CO₂ emissions. Repairing these leakages needed no investment.

KEYWORDS

Indonesia, Cement, Compressors & Compressed Air System, Leaks

OBSERVATIONS

The Indarung IV plant has two compressor houses that houses four compressors; out of which two are functional (J3K32 & J3K34) and two are in standby (J3K33 & J3K35). J3K33 was damaged. There is also the cement compressor house, consisting of only one compressor (GA90). All the compressors in both the houses have no flow-meters. The observations made with the compressed air leaks survey indicated leakages at piping connection, water trap, valve, house connection, house, elbow connection, solenoid valve, air shaking, air tank and pressure valve. The leak survey used the soap solution method to detect leakage points.

OPTIONS

The option chosen was to seal the compressor air leaks in all the piping installations. Leakages detected by soap bubbles were marked with a color paint. 23 leak point repairs were carried out by tightening the screw pipe and by sealing leaks. Afterwards, the repaired part is painted with a different color. Loading and unloading measurements are carried out before and after the leak repair.

RESULTS

Cost savings calculations are done with the differences in loading and unloading values of the compressor before and after the leak repair. Calculations were based on the percentage loading, power and assuming that the compressor is in operation 24 hours/day for 330 days in a year.



Table 1. Calculation result power consumption

Compressor	J3K32	J3K34	GA90	Total
Total Power, kWh/yr Before leaks repairing	960,652.88	981,119.21	398,726.88	2,340,498.97
Total Power, kWh/yr After leaks repairing	925,917.32	944,949.40	376,354.98	2,247,221.7
Power difference, kWh/yr	34,735.57	36,169.81	22,371.90	93,277.27

After repairing the leakages, the total saving is 93,277.27kWh/year.

Financial benefits

- Investment: none
- Annual cost savings: 93,277.27 kWh/yr x Rp512,-/kWh (energy price)
= Rp 47,757,962 (US \$ 5,306 *)
- Payback period: immediate

Environmental benefits

- Annual energy savings: 93,277.27 kWh (2,340,498.97 kWh/yr - 2,247,221.7kWh/yr)
- % energy saving from total energy consumption: 3.98% (93,277.27 kWh/yr/
2,340,498.97 kWh/yr x 100 %)
- Annual GHG emission reduction: 67.53 tons CO₂ (93,277.27 kWh/year x 0.000724)
(conversion factor**)

(*)USD 1 = Rp 9,000

(**) www.unepie.org/energy/tools/ghgin

FOR MORE INFORMATION

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