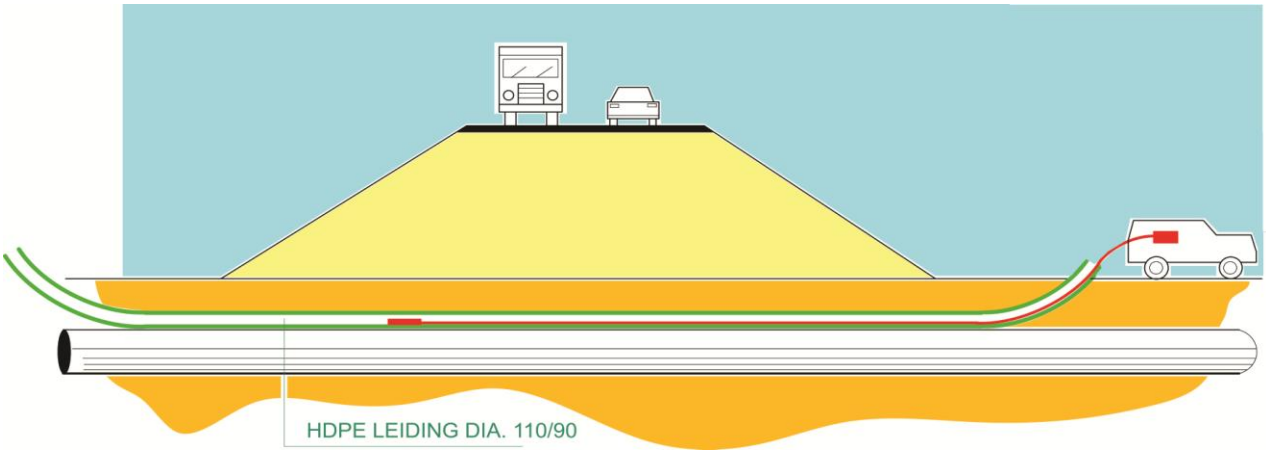
MONITORING THE ROTTERDAM-RHINE PIPELINE WITHE THE LPMH-SYSTEM

THE PROJECT.

The underground Rotterdam-Rhine Pipeline (RRP) continuously transports 2400m^3/hr oil products from Pernis (Rotterdam) to Germany at an operating pressure of 60 barg. To provide access to a newly built housing area a road had to be constructed that crossed over the RRP. Soft subsoil conditions demanded that the RRP would be monitored on possible settlement during the construction of the road. Because of heavy traffic of road construction equipment, combined with the required accuracy of the measurements, the use of levelling rods was no option. The LPMH-system was the only solution.

MONITORING THE RRP.

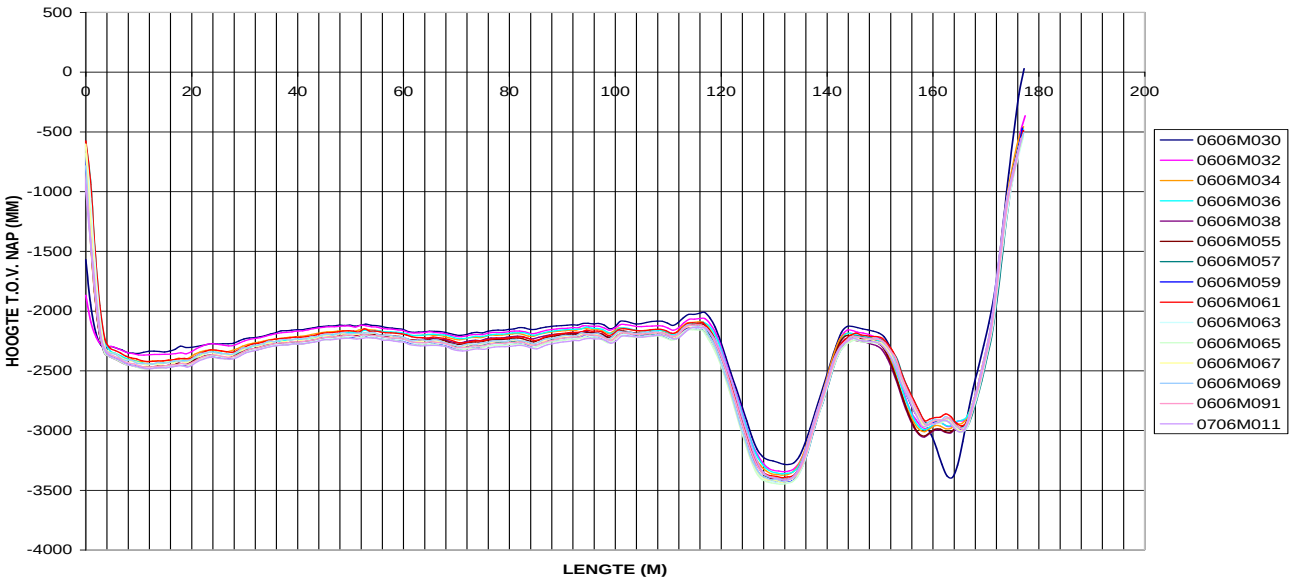
Inventec was ordered by consulting engineer Grontmij to monitor the RRP wiht the LPMH-system for a period of over 1,5 years. For this purpose a HDPE pipe with an internal diameter of 90mm was fixed on top of the RRP over its full exposed length. By repeatedly measuring the profile of the 200m long HDPE pipe with length intervals of 1,00m it was possible to monitor the settlement of the RRP and to ascertain that it would not deform beyond strictly defined limits. A second HDPE pipe was installed in the light weight backfill material around the RRP. This pipe was measured with the same frequency as the pipe on top of the RRP.



An important additional advantage of the LPMH-system in this particular case was that the measurements could continue after the construction was finished and the road had been taken into service so that any possible effects of the traffic load could be measured. These measurements were perfectly reproducible with the first (zero-)measurement at the start of the construction of the road.

MEASURING WITH THE LPMH-SYSTEM.

The system basically consists of a measurement probe containing a pressure transmitter that, via a hose on a reel, is connected to a liquid reservoir. The probe is pulled through the settlement pipe or drain line with intervals, (e.g. 1,00m, 2,00m, 5,00m etc). Recording the hydrostatic pressure at each interval results in the relative profile of the pipe's level. By subsequently putting the probe on a fixed point outside the pipe it is possible to relate the pipe's profile to the national grid level. By repeating the measurement with time intervals the progression of the subsidence of the subsoil is determined in a very accurate manner. To ensure maximum accuracy each measurement is automatically compensated for variations in temperature and atmospheric pressure. The measurement vehicle is fitted with an automatic processor/datalogger so that the readings can be made available right on the spot, if so required.



Contrary to other systems available on the market, the LPMH-system does not require that the pipe itself is filled with water: the LPMH-unit has its own liquid system. Whether the pipe is empty or wholly or partly filled with liquid (e.g. groundwater or drain water) does not make any difference for the operation of the LPMH-system.

WHEN MEASURE WITH LPMH?

- When there is not enough space to use leveling rods.
- Noise abatement walls constructed of residual waste material.
- Monitoring residual subsidence of road/embankments after the work has been put into service.
- Backfilling of waterways.
- Surveillance/inspection of underground pipe lines.
- When levelling rods are considered not sufficiently accurate for the purpose.

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