



# European cross-country oil pipelines

## Monitoring the safety and environmental performance of Europe's oil pipelines

CONCAWE first became involved with oil pipeline safety issues in the mid-1960s when it started collecting information and statistics on incidents and spills related to European cross-country oil pipelines. Annual data have been collected since 1969 through a survey of pipeline operators. The first report was published the same year and annual reports have been published since 1972. Starting in 2006, the annual report has included all historical data with each report superseding the previous one.

Over a period of more than 40 years, the fraction of the total pipeline network covered by the CONCAWE survey has steadily increased, in particular through the incorporation of the NATO lines in 1988, the East German network in 1991 and a number of former Eastern bloc countries from the turn of the millennium. The statistics now cover most cross-country oil pipelines in the EU.

The so-called 'CONCAWE pipeline spillage report' has become a unique and trusted source of information throughout the industry and for other parties such as the EU institutions and Member States. Beyond the simple statistics, the large volume of data collected allows additional analyses to be made and conclusions to be drawn on what are the most important factors affecting the safety and integrity of cross-country oil pipelines in Europe.

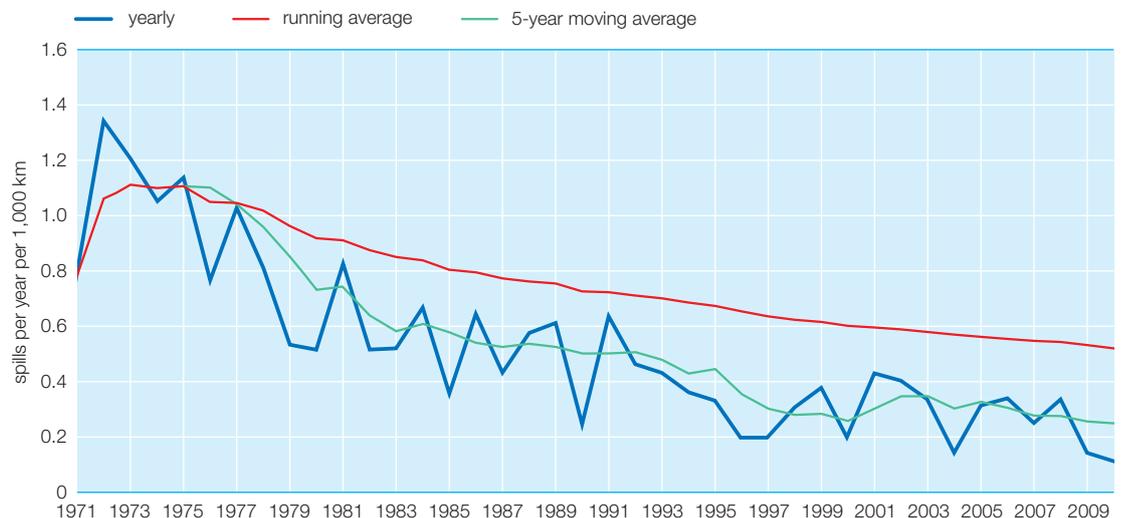
Through this work CONCAWE has demonstrated that pipelines are a reliable and safe means of transporting oil products. Although pipeline spillage incidents do sometimes occur, they are usually infrequent and their consequences on the environment are limited.

Over the entire 40-year period, there have been 14 fatalities in 5 separate pipeline incidents and 3 injuries. With one exception, these fatalities were not caused by the leak per se but rather resulted from fires or explosions during clean-up and repairs subsequent to the leak, pointing towards deficient work procedures. Neither fatalities nor injuries involved members of the general public.

Over the years, the frequency of spillage incidents has consistently decreased (Figure 1).

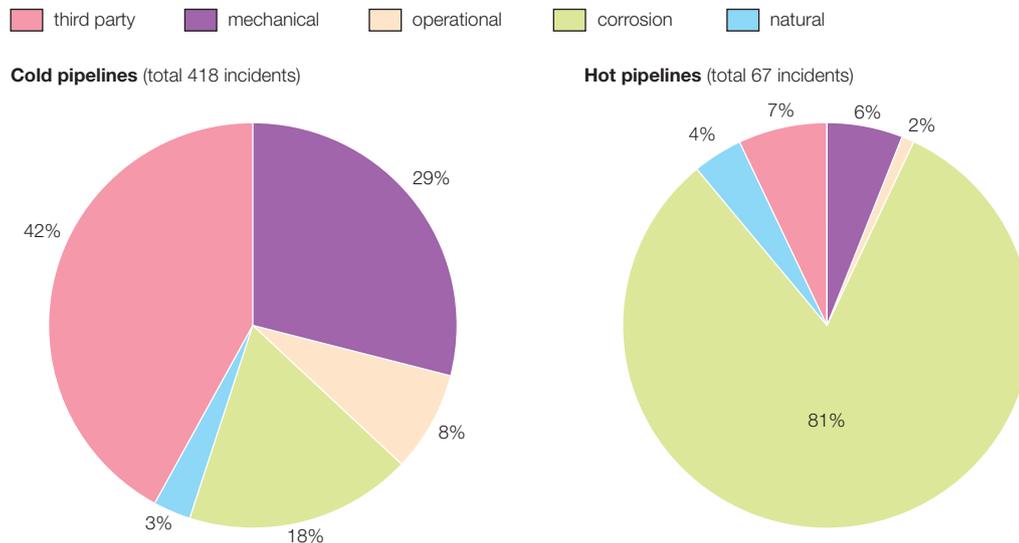
The average volume of oil spilled has also decreased over time although the volume spilled from individual incidents can be variable. This decrease in average volume has been achieved through continuously improving maintenance practices and inspection techniques against a background of steadily increasing age of the pipeline system (most European pipelines were installed in the 1960s and 1970s). The data demonstrate that there is no causal link between the age of the pipeline and its failure rate.

Figure 1 EU cross-country oil pipelines spillage frequency





**Figure 2 Distribution of major spillage sources for hot and cold pipelines, 1971–2011 (total 485 incidents)**



*A small proportion of the pipeline inventory consisting of insulated pipelines transporting hot products (mainly heavy fuel oil) has historically been mostly affected by external corrosion. For cold product pipelines, the largest fraction of pipeline spillage incidents is due to third parties, mostly during excavations unrelated to the existing pipelines.*

Figure 2 illustrates the analysis of the causes of spillage incidents for both hot and cold product pipelines.

'Hot' pipelines represent less than 1% of the total inventory today but have accounted historically for 14% of the total reported spillage incidents. These pipelines are a small and decreasing part of the inventory and consist of insulated pipelines that transport heated products, mainly heavy fuel oil. These pipelines are affected mostly by external corrosion, and the majority have been phased out over the years, partly for this reason.

Third-party activities cause by far the largest proportion of pipeline spillage from cold pipelines. In the vast majority of such cases, pipeline spillage is unintended and is the result of excavation or other earth moving activities in the vicinity of the pipeline. There have also been a few cases of theft or attempted theft. Pipeline operators are keenly aware of the problem and strongly support the development of national and EU-wide so-called 'one-call' systems where all planned excavations must be declared and authorised. This approach is relatively simple to implement and will protect pipelines and other underground infrastructure.

The design, construction and operation of pipelines are already tightly regulated in most EU Member States. The CONCAWE performance statistics strongly sup-

port the view that a 'Seveso-type' EU-wide legislation for pipelines is unnecessary and would impose additional costs and administrative burdens on the industry for very little (if any) return.

CONCAWE's pipeline activities are carried out through the Oil Pipeline Management Group (OPMG), membership of which is open not only to CONCAWE member companies but also to all companies operating oil pipelines in Europe. In addition to compiling the annual statistics, this group provides a valuable forum for exchanging information on a number of topics, including: causes of incidents and lessons learned; developments in safety management; and pipeline condition monitoring, especially the use of in-line inspection tools.

The 'CONCAWE Oil Pipeline Operators Experience Exchange' (COPEX) seminar takes place every four years (the next one is planned for 2014). These seminars are open to all pipeline operators in Europe and beyond but only by invitation for suppliers of equipment and services (usually for specific presentations). As a result COPEX provides a unique opportunity for a broader, practical and objective exchange of knowledge, experience and best practices. These seminars have enjoyed continued popularity, which bears witness to their relevance. Proceedings of the 2010 COPEX are available on the CONCAWE website.