

Performance of European cross-country oil pipelines

Statistical summary of reported spillages in 2006 and since 1971

Since 1971, CONCAWE has been collecting data on spillages from cross-country oil pipelines in Europe. The information is collated in an annual report which includes an analysis of the human and environmental consequences and of the underlying causes of such incidents. CONCAWE report 7/08 presents the results for the year 2006 and an analysis of the accumulated data for the whole 36-year period from 1971 to 2006.

Pipeline inventory

The 'CONCAWE inventory' includes about 35,000 km of cross-country oil pipelines, representing the bulk of such facilities in Europe. This inventory, which originally covered mainly Western Europe, has grown over the years and gradually expanded eastwards. Additionally, the majority of the non-commercial (mostly military) pipelines joined the scheme in the late 1980s, accounting for a big jump in the size of CONCAWE's survey inventory. These pipelines transport some 800 Mm³ of material every year, i.e. more than the total EU refinery throughput, about 2/3 of which is crude oil and 1/3 refined products. The majority of

these pipelines were laid in the 1960s and '70s, as a result of which the average age of the inventory has been increasing (Figure 1).

Number of spills and volume spilled

In spite of this ageing, the annual number of spills has slowly decreased over the years, while the spillage frequency shows an even stronger downward trend (Figure 2). Although there are large variations from year to year, the total annual volume spilled has remained broadly constant at around 2000 m³/a, even though the inventory surveyed has significantly increased over the years. On average, about 60% of the spilled oil is recovered.

Causes of spills

CONCAWE analyses the cause of spillage through five main categories, i.e. mechanical, operational, corrosion, natural events and third-party interference, and a number of sub-categories. The distribution of spills according to main cause is shown in Figure 3, separately for 'hot' and 'cold' pipelines.

Figure 1 Total length surveyed and age distribution

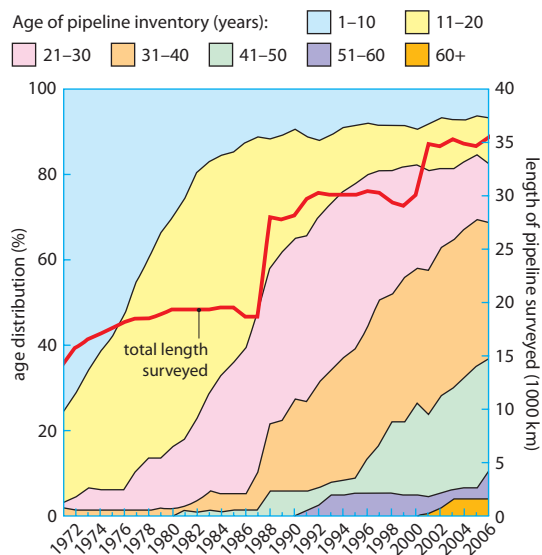
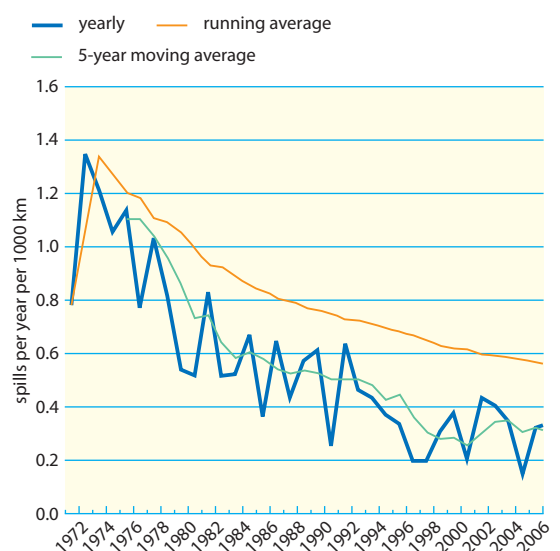


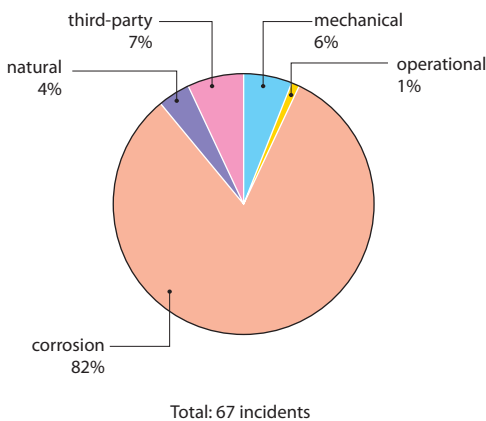
Figure 2 Pipeline spills, 1971-2006



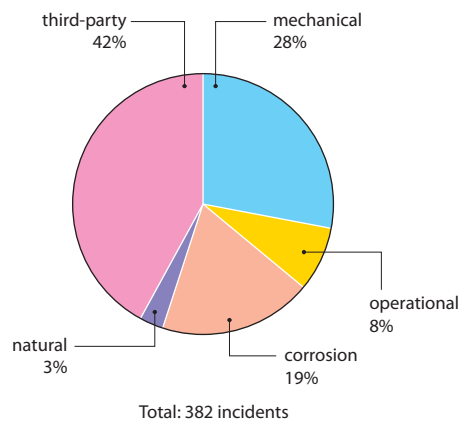
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Figure 3 Causes of major spills

Hot pipelines



Cold pipelines

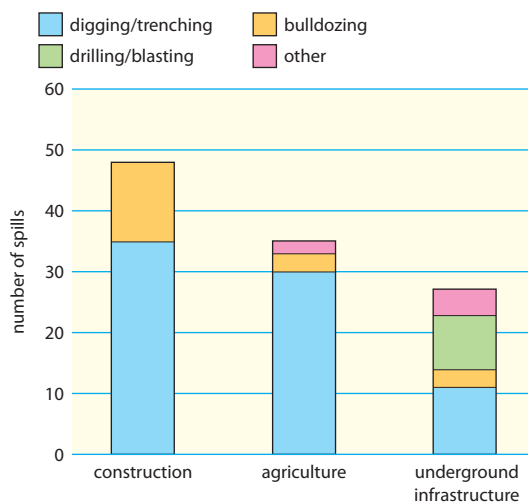


'Hot' pipelines form a small and decreasing part of the inventory and consist of insulated pipelines transporting hot products, mainly heavy fuel oil. These pipelines are mostly affected by external corrosion and, partly because of such corrosion problems, the majority have been phased out over the years. Today they represent less than 1% of the total inventory

For the bulk of the inventory ('cold' pipelines), the most common causes of spillage are corrosion, mechanical failure and third-party interference. Although internal and external corrosion failures have occurred in cold pipelines, there is no evidence that these are on the increase, suggesting that corrosion issues are well under control in spite of the general ageing of the inventory. Mechanical failures occur as a result of a range of causes related to design and materials, as well as construction defects.

Third-party interference is seen by pipeline operators as the main threat to the integrity and safety of their operations. A small proportion of the spillages caused by third party activities is the result of malicious or criminal activities (theft attempts), but the majority of these spills are accidental and mostly related to farming and excavating

Figure 4 Causes of accidental third-party spills



activities (Figure 4). The industry is actively engaged internally, with land owners and contractors, and with national authorities and regulators in order to devise ways to reduce this threat.