Hazards of Transporting Petroleum by Road

Executive Summary

3.1 The record of road safety in petroleum transportation in Sub-Saharan Africa is poor, and the lack of sufficient statistical data in the public domain on petroleum transportation in the region has made it difficult to assess the magnitude of the problem. Therefore, the consultant team conducted extensive field visits to gather information on:

- Laws and regulations on transportation of petroleum
- Safety statistics
- Policies and procedures used by oil companies and petroleum transporters
- Current work practices
- Operation of petroleum vehicles at loading and discharge facilities and on the road.

The countries visited in this connection were Ghana and Côte d’Ivoire in West Africa, and Ethiopia, Kenya, Mozambique, South Africa, and Tanzania in East and Southern Africa. The team interviewed government officials, oil company staff in local and head offices, and representatives of transport companies, transport federations, and road safety organizations. Prior to the field visits, the international regulations and work practices of a few international oil companies in Europe were reviewed.

3.2 In general, the following opinions/views were heard from individual persons and organizations:

a. There is a lack of awareness and respect for road safety among the public, which is also reflected in the lack of government policies and lack of adequate enforcement.

b. There is a lack of awareness of the dangers and environmental concerns involved in the handling of petroleum.

c. Efforts to improve road tanker safety should also include the general public, and road safety measures should be given priority in SSA.

d. Appropriate laws and regulations should be adopted and be given wide publicity so that the public as well as industry members are aware of their existence.
3.3 Overall, transport of petroleum by road in SSA currently involves a number of safety hazards including bad roads, poorly maintained vehicles, low operational standards, lack of safety awareness, and weak enforcement of existing laws and regulations. A satisfactory resolution to this situation would require close cooperation from governments, oil companies, and transporters. They should jointly prepare a long-range action plan to address the issues involved. The oil companies, with their international experience and established standards, should take the lead in preparing such a program. The main features of the program recommended are summarized as follows:

- Establish a system to report petroleum transport accidents, including all details.
- Establish petroleum associations with mandates (see paragraph 8.3 in this chapter).
- Make insurance and accreditation of transporters mandatory.
- Develop licensing to ensure a basic requirement of competency for all operators.
- Establish transport tariffs that provide incentives to improve safety standards.
- Review the current oil company policy of outsourcing transportation requirements.
- Give high priority to enforcing laws and regulations.
- Establish a program to exchange best practices and other experience in the Sub-Saharan region.
- Give more publicity to petroleum safety.

Safety Statistics

3.4 Although general traffic accident statistics from the countries visited indicate increasing accident rates, there was no specific identification in these statistics of vehicles transporting petroleum products. Comparing data collected on the accident rates in Sub-Saharan countries with the accident rate indicators used in official statistics in Norway reveals that (a) the number of fatalities (per 1000 vehicles) is very high in most Sub-Saharan countries (albeit substantially lower in South Africa, Zimbabwe, and Namibia than in the rest of Africa) and that (b) the number of fatalities per accident is increasing in SSA, whereas in Norway the figure is decreasing.

3.5 Representatives of many oil companies and petroleum transporters voiced the opinion that a significant number of accidents attributed to the petroleum industry are actually caused by third parties. However, consultant research indicated that the general complaints of bad driving, badly maintained vehicles, bad road conditions, inappropriate attitude, and so on are equally applicable to petroleum carriers. Their contribution to fatalities is significantly higher than that of other types of carrier due to the high inflammability of petroleum. This makes it more desirable for the oil industry to take a lead role in setting essential standards.

Standards and Regulations

3.6 Among the limited number of applicable international standards, specifications, and regulations related to petroleum road transportation safety, the best known are the United
Nations Transportation Regulations and the European Community ADR. These regulations could form the basis for individual country or regional regulations, as happened in South Africa.

3.7 International oil companies have their own standards, which are based on industry best practices in North America and Europe. Such organizations as the American Petroleum Institute, the National Fire Protection Agency of America, and the U.K. Institute of Petroleum have, through a series of industry agreements, translated such industry best practices into Codes of Practice. These are accepted by legislative and regulatory authorities as defined minimum standards for the construction and operation of petroleum facilities. Operating licenses and legally required insurance cover are issued subject to adherence to such accepted standards. Regular auditing by competent authorities ensures close observation of such standards. Experience indicates that internal international company standards normally exceed the specific requirements detailed in local legislation both in the OECD countries and elsewhere.

**National Regulatory Regimes and Enforcement**

3.8 The team observed that, in most of the countries visited, legislation covering transportation does not include regulations specifically for petroleum transport. Moreover, the lines of responsibility with respect to such regulations are not clear in most instances. For these reasons, there is a certain amount of confusion regarding the requirements to be met by oil companies and petroleum transporters. There have been cases where local representatives of oil companies are unaware of some of the existing petroleum regulations.

3.9 In many places it was observed that the enforcement agencies could not perform their work diligently due to lack of sufficient authority, resources, and training. In order to strengthen enforcement, it is recommended that (a) legal requirements be made clear to both the public and to the enforcement officers; (b) responsibilities for enforcement be defined; and (c) penalties for failure to meet legal requirements be defined. Further, the testing and inspection services could be contracted to competent agencies that could carry out pre-license inspections, and random inspections could be conducted by suitably trained enforcement agencies on the road.

**Transportation of Petroleum & Oil Company Policies**

3.10 With a few exceptions, petroleum products in the Sub-Sahara are distributed by trucks directly from the refineries and import terminals. The majority of the fleet consists of old second-hand trucks that are poorly maintained following importation into the country. Due to local conditions and the lack of good equipment and qualified personnel, there is a wide gap between policies and reality. Currently, a number of countries encourage new entrants, often local inexperienced operators, into petroleum marketing and transportation without enforcing requirements on skill and experience. Differing taxation regimes in neighboring countries often encourage unscrupulous cross-border trade based on instant financial gains at the expense of quality and safety standards. All these have contributed to an increase in the use of inexperienced drivers and badly maintained and overweight vehicles, resulting in degradation of the road.
surfaces and of the environment in general. Regional cooperation among the countries involved should be encouraged to establish a common strategy to minimize such activities.

3.11 It has become common practice for African subsidiaries of international oil companies to out-source as many activities as possible. Although profit maximization is the main motive for this, the practice has increased transportation of petroleum products by contractors in poorly maintained vehicles. Even though it is a successful policy in Europe and United States, it has caused substantial deterioration in safety and environmental measures in SSA due to inadequate enforcement of the oil companies’ standard policies regarding safety and environmental measures. The tests performed by the oil companies are insufficient and some vehicles are accepted when on safety grounds they should be rejected. The oil companies have moral (although probably no legal) responsibility to ensure that their contractors adhere to the oil company standards. They should increase their efforts to audit and inspect the facilities used by their contracting companies. They should also work with governments to enforce policies to improve service quality.

Roads, Vehicles and Driving

3.12 In general, road conditions in all countries in SSA are poor due to over-heavy vehicles and long delays in repairing small damage to the road surface. Although the main roads frequently pass right through villages, drivers do not reliably observe speed limits.

3.13 Vehicle condition is also generally poor. In some countries general cargo vehicles are converted for petroleum transport by mounting a large horizontal barrel on a flatbed goods trailer. Such conversions produce a tank trailer with a significantly higher center of gravity than is standard, seriously affecting the stability of the vehicle. Common vehicle faults include worn and mixed tires, bad brakes, faulty suspension, bad steering, missing or inoperative fire extinguishers, damaged lights, broken windshields, and unserviced engines. In spite of the checklists enforced by some of the oil companies, trucks with such poor conditions are allowed to be loaded at various terminals. On the other hand, oil company–owned trucks are in fairly good condition.

3.14 Compelling the oil companies to accept sub-standard contractor vehicles are a range of factors including a lack of checklist usage on a rigorous basis, the inadequate length of time taken to train the personnel involved, bad road conditions, and political pressures and threats of action in the form of strikes. Some of the positive signs observed are a defensive driving institute and workshop established by Shell Ghana and a licensed international inspection company (SITCA) providing vehicle testing facilities in Côte d’Ivoire.

3.15 Given the special requirements of potentially dangerous loads, the competency of the drivers operating petroleum trucks is very low. Very often they do not have sufficient knowledge about the inflammable and explosive nature of petroleum products and precautions required to handle them. Drivers do not observe “black spot” signs and take unnecessary risks. A general road-safety awareness program for all road users is essential for improvement of safety performance in petroleum transportation. There should be intensified mandatory training

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3 Public authorities put up “black spot” signs at places on roads where there are many accidents.
programs to overcome the drivers’ lack of knowledge and competence. Once the drivers are trained, tachographs should be widely used as a control and audit mechanism to enable the drivers to operate almost totally unsupervised once they leave the storage depots.

**Handling of Dangerous Goods**

3.16 The lack of legislation in many countries in SSA concerning handling of dangerous goods has left the public and some industry members unaware of many safety issues. Limits or rules should be established for volume limitations, hours of operation, vehicle and driver licensing requirements, essential safety and emergency equipment, parking and offloading area designation, routing limitations, and emergency response facilities and actions.

**Regional and National Cooperation Initiatives**

3.17 Regional organizations include the Southern African Development Community (SADC) and Southern African Transportation and Communication Committee (SATCC), the Common Market for Eastern and Southern Africa (COMESA), the Economic and Monetary Union of West Africa (UEMOA) and the Economic Community Of West African States (ECOWAS). However, issues related to vehicle inspection system, check lists, and standardized testing stations are not in their agenda. Currently one of the SADC committees is developing common vehicle standards for weight, axle load, length, width, height, and so on to make cross-border traffic easier. SATCC, headquartered in Maputo, is trying to harmonize and develop regulations for hazardous substances. The governments and oil companies should encourage such efforts. In some countries petroleum associations have been established that could help to promote safety.

3.18 Three international oil companies have formed an Industry Safety Steering Committee in the Caribbean and Central America that has published minimum standards for contractors, vehicles, and drivers. It is based on mutual confidence between government authorities and the oil companies, but it gives the authorities a basis for auditing the oil companies’ control of the transport activities. This could be replicated elsewhere.

3.19 The mandate for a typical Petroleum Association should include the following:

- Collection and recording of safety statistics
- Motivation campaigns
- Petroleum vehicle inspection procedures at terminals and on the roads with checklists
- Weight control measure to prevent overloading
- Safety performance indicators
- Methods for tracking vehicle position
- Essential technical specifications for vehicles and attached equipment
- Night driving standards
- Measures to identify dangerous areas on the roads
- Training standards and programs for approved drivers
- Standardized transport contracting procedures
• Contingency plans and procedures to mitigate the effects of accidents
• Techniques for publicizing rules and regulations.

Transportation Options, Costs, and Liberalization

3.20 The hazard of petroleum transportation by road is growing in SSA as the number of vehicles increases and their quality standards deteriorate in the absence of any serious initiative to provide alternative transport modes for petroleum products. The hazards could be reduced considerably if suitable conditions are created for more petroleum to be transported in pipelines and by rail. Constructing new pipelines and railway lines may be difficult to justify on economic grounds. However, a regional approach by different groups of countries to pool their requirements, under standardized quality, transport volumes could be increased to make modernization/extension of existing pipelines and railway lines economically attractive for petroleum transport.

3.21 Africa has a few commercially viable pipelines (as in Kenya, Tanzania/Zambia, and Zimbabwe) and others may be justified. Many companies have resisted using existing railway lines even where there are no other alternatives except for poorly maintained roads. There are arguments against using more rail facilities due to inefficiency of rail system management, poor conditions of rail tracks, lack of sufficient tank wagons and locomotives, and pilferage. However, with cooperation from the governments, oil companies, and international donors, suitable remedial measures could be taken to mitigate these fears and maximize long distance bulk transportation of petroleum products by (a) using dedicated trains (which will increase the utilization efficiency of tank wagons and thereby reduce costs) and by (b) requiring the railway to operate competitively—i.e., reducing fees, eliminating theft, and delivering goods intact and quickly. In most of the countries, the truck owners’ powerful lobbies could work against such programs, but the governments concerned should favor rail transport of petroleum products on the basis of safety, environmental protection, and overall national interest.

3.22 In many places oil companies and transporters mentioned that the transport profit margins prevailing under the current cost-plus product pricing structure do not cover the actual costs involved. As a result, transporters are forced to disregard safety regulations to increase their profit margins. A direct answer to this problem in a regulated pricing system is to review the cost of transportation, taking into account all the safety, environmental, and other regulations stipulated. Governments should give safety and environmental issues high priority when planning a regulatory framework and monitoring mechanism as part of any program for deregulation/liberalization of petroleum distribution.

Recommendations

3.23 The hazards associated with petroleum transportation by road in SSA could be reduced if the governments, oil companies, and transporters cooperate to establish a long-range action plan. In each country the oil industry, with its international experience, should take the lead and work with the government and transporters to establish basic standards. It is important that the governments and oil companies define clear responsibilities and agree on how to divide responsibilities. One ministry for each country should be made responsible for decisionmaking, in consultation with other ministries and government agencies as required. The oil companies and transporters should organize how they will work with the government institutions.
the next petroleum workshop these ideas will be further developed, in consultation with representatives from governments and oil marketing companies, to prepare a time-bound action plan.

**Role of National Governments**

- The role of each country government should be to establish safety standards and liability, the need for insurance, and so on through legislation. To motivate self-compliance, the legislation should be clear and the penalties adequate. The government should then ensure that the laws are enforced, and for those countries not currently doing so they should assess why they are failing on their own laws. Governments have a responsibility to educate the public on safety matters.
- Each government should use laws and regulations to define the basic competency requirements of oil companies and transporters.
- In countries where prices are regulated, governments should review the transport margin to ensure that it does not lead to pressure to use sub-standard vehicles. Prices should be adequate to remunerate investments in safety.
- Each government should ensure the operation of a reporting and recording system for petroleum accidents, in cooperation with the oil companies.
- The governments are responsible for ensuring safe road conditions, and should fulfill their responsibilities.
- The governments should work with the oil companies to ensure a more efficient and effective petroleum sector. They should take advantage of regional associations.

**Role of Companies**

- Companies need to become good corporate citizens. They should take the lead in defining ways to improve safety, including public education on petroleum safety issues. They should take responsibility for the operational aspects of the industry through (a) accepting moral responsibility for the actions of their own staff and contractors and (b) arranging ways of getting the message across to public communities. At a practical level the measures should include operating an accreditation scheme for transporters, using well-defined specifications.
- In addition, because the companies are best equipped to handle operational matters, they should work with the national governments to (a) help ensure that operational experience is brought to bear when formulating the rules and regulations and (b) undertake the operational aspects of petroleum safety. Because national and regional cooperation will be essential to achieving these goals, the companies should form national and regional associations.