

## **Raising Awareness of Response Bodies on Health, Safety & Environmental Risks and Accident Prevention in Supply / Distribution of Fuels and other Dangerous Substances: The PROTEAS Protocol**

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### **Abstract**

The European Project PROTEAS (LIFE+ 09/ENV/GR/291) developed a PROTOCOL of GOOD PRACTICES with the essential Health, Safety and Environmental (HSE) provisions, procedures, obligations and recommendations useful to all stakeholders involved in the management of chemical risks related to the supply and distribution of fuels, petrochemical products and other dangerous substances. The protocol supports the implementation of Regulations aiming at the reduction of human and environmental consequences arising from the emissions or accidental releases of hazardous chemicals in different transportation modes (road, rail, sea and pipelines) and supply stages such as loading/unloading, in transit, temporary storage and distribution. Project's primary goal is to raise the awareness of stakeholders, civil protection bodies, employees and the public on HSE risks and accident prevention.

Analysis of ~25,000 international accidents involving dangerous substances of all Classes (e.g. flammables, toxics, corrosives) indicated that road transportation of fuels and loading/unloading in particular pose higher risks than other modes of transport or supply stages. Human casualties are mostly related to lighter fuels (Gasoline) while environmental impact to heavier fuels (Diesel). The existing HSE regulatory framework related to REACH/CLP, ADR, RID, IMDG, SEVESO etc. and best industrial practices were examined. Life Cycle Analysis (LCA) performed for all transportation stages of primary fuels in Greece (Gasoline, Diesel and LPG) showed that the environmental impact of normal transportation releases and accidents is low compared to the emissions from combustion engines and electricity usage relevant to transportation. Water, soil and air samples taken from 400 sites around Greece were analyzed for PAHs, n-alkanes, VOCs and BTEX, and evaluated with fingerprinting methods. The results of 700 measurements in loading/unloading sites and highly frequented locations of fuels (ports, truck & petrol stations, etc.) showed that concentrations of pollutants are well within regulatory limits with soil and sediments keeping a better pollution memory than surface water. The sample analysis results are in accordance with the LCA results for Greece indicating relatively low impact mostly on Respiration of Organics.

The PROTEAS Protocol, based on Best Available Techniques, was validated through a prototype Safety Management System. A web application of the protocol was developed including practical HSE guidelines on the control of accidental releases and the safe handling of fuels and selected hazardous chemicals for each transportation mode, Life Cycle stage and substance Hazard Class. The guidelines cover user- and product-specific: Regulatory requirements, SMS procedures and provisions, HSE prevention and protection measures and Emergency response plans for more than 1,500 chemicals.

The PROTEAS Protocol supports and promotes the implementation of national regulations and their performance. As a pilot, an Inspection e-tool for ADR roadside checks was designed and developed in collaboration with the Hellenic Ministry of Transport. The inspection e-tool with user friendly interface on tablet provides handy utilities and specifications to ADR Inspectors conducting road checks of vehicles carrying dangerous goods.

The overall PROTEAS project results and the Protocol comprise an integrated guidance with training package and e-tools, which are widely disseminated through the operation of three experts Working Groups on REACH/CLP, SEVESO and hazardous pipelines and the project web platform (<http://proteas-reach.gr>)

**Key-words:** transportation, distribution, fuels, hazardous chemicals, emissions, accident prevention, good practices protocol, ADR inspections, LCA.