



TK-Global Environment™

WHERE EFFICIENCY AND RELIABILITY BECOME A REALITY



Products and services insured by



TechnoKontrol is a member of the



INDEX

4	Environmental Recycling & Cleaning Services
8	Environmental Safety & Security Programs
14	Environmental Chemical Engineers
16	Oil Industries
18	Power Generation Industries
25	Chemical Environmental Programs
37	Environment & Utilities
47	Climate, Atmospheric, Electrostatic, Aerial Charges, Corrosion, Condensation & Maintenance Incidents
59	Industrial Chimney Filter Recycling System
69	Mobile Recycling Filtering Technologies
70	Mobile Eco-Green Industries
71	Eco Warrior Mobile
77	Eco Warrior Independence
83	Eco King Warrior Independence
89	Eco King Fighter
99	Protection Cooling Tower Systems
111	Aim of the Test Program
115	Pipelines, Fracking & Pumping Stations Environmental Damage, Security and Safety Issues
120	What are NGLs and what kind of risks are associated with an NGL pipeline?
132	Does the pipeline company have the ability to protect the pipeline route?
152	Certificates
154	Legal

TECHNOKONTROL ENVIRONMENTAL RECYCLING & CLEANING SERVICES

TECHNOKONTROL FUEL / CHEMICAL ENVIRONMENTAL, SAFETY & SECURITY ACCIDENT / DAMAGE RECYCLING SERVICES.

ENVIRONMENTAL RECOVERY, CLEAN UP, RECYCLING SYSTEMS AND TECHNOLOGIES FOR ALL CONTAMINATION ACCIDENTS FROM ALL TYPES OF TRANSPORT PETROL-CHEMICAL SPILLS TO PIPELINE THEFT/VANDALISM DAMAGE AT PRIVATE OR GOVERNMENT LEVELS.







TECHNOKONTROL ENVIRONMENTAL RECYCLING & CLEANING SERVICES

TECHNOKONTROL ENVIRONMENTAL RECYCLING & CLEANING SERVICES provides onshore and offshore cleaning and decontamination services, supporting a blue-chip client base principally in the oil and gas, petrochemical, heavy industry, manufacturing and pharmaceutical sectors.

In many years of operation we have developed a reputation for pioneering and integrating a wide range of safe, environmentally sound, industrial cleaning techniques involving high pressure water jetting, high airflow vacuum services and chemical decontamination processes.

We complement all our cleaning services with extensive integrated waste management services and on-site waste handling capabilities, as well as utilities infrastructure monitoring and refurbishment services.

TECHNOKONTROL ENVIRONMENTAL SAFETY & SECURITY PROGRAMS

At TECHNOKONTROL we normally use our own services to prepare and to install our safety & security technologies in already operational assets or transports as fuel tanker, oil tanker, jumbo tanks, etc.

Our anti-explosion, anti-vaporization, anti-static charge, anti-sloshing products are 100% eco-friendly and 100% recyclable thus being able to use a preventive safety technology for a "Pro-Active Protection Environmental Program" or for a "Clean Up Program" after an accident or disaster as our products not only are security-safety proof but also preventing explosions, fires, fumes, vapors due to terrorism, sabotage, vandalism, climatic accidents, fuel thefts, attacks, any type or kind of accidental damage.

Due to the cost being not only environmentally extremely high to a region, state, town and to its people, commerce, but also not forgetting the legal, criminal, punitive damages which will be claimed via national & international courts ,insurance payouts, corporate shut-downs, loss of operators licenses, multi-million

dollar fines, we at Technokontrol try always to make a disaster become at least and as less as possible of an environmental, financial, social burden but also having the additional environmental & financial benefits of acting in a "pro-active manner", thus always trying in saving the operator in petro-chemical vaporization losses, algae growth-fuel damage, oxidation-fuel contamination but especially saving the environment at the same with these financial operational savings.

Due to these kinds of possible incidents but also using an accidental or criminal "oil spill" to create an income to reduce the overall cost of any "Emergency Clean Up Program" due to being able to use crude oil, petrol-chemicals to create alternative fuels as diesel for re-sale, re-usage or to pay in compensation packages to the effected region, state, government for such accidental or deliberate attacks on these infrastructures.

Depending on the needs we will use one type or another for proactive or after-disaster environmental programs depending on the client's needs and services.



REDUCING THE COST OF AN ENVIRONMENTAL INCIDENT

Our focus is on total job-cost reduction, minimizing plant downtime cleaning to optimize production up-time. A combination of Technokontrol Environmental Services (TK-ENVIRONMENTAL) highly-skilled operational personnel, along with our degree-qualified engineers, works closely with you to design and manage your project, utilizing advanced cleaning technology to achieve the most appropriate solution.

The quality of our operational solution delivery is also important to your inventory cost, generally extending the mean time required between cleaning operations. Further, as we offer a full suite of integrated technical solutions, specified and bundled to meet each separate cleaning requirement, you are able to appoint fewer, or just one, appropriately resourced supplier.

SAFETY IS PARAMOUNT

Our emphasis on finding new ways to solve cleaning and decontamination problems is nowhere more apparent than in our work to enhance safety through technology often by using sophisticated 'non-man entry' techniques.

We use our own experienced industrial services staff throughout the World onshore and off shore sectors, while our relevant managers and engineers oversee local resources elsewhere in the world, to help minimize costs.



TK-ENVIRONMENTAL CHEMICAL ENGINEERS

TK-ENVIRONMENTAL highly experienced qualified chemists, chemical engineers, project managers and trained operatives solve issues and deliver customized chemical cleaning and decontamination services, particularly to the oil, gas and power generation industries. We use a wide range of cleaning agents and chemicals, including our own proprietary formulations.



We use our chemical cleaning expertise on the following types of units:

- Alkylation units
- FCC units
- Exchangers
- Fin fans
- Boiler plants
- Flare lines and drums
- Crude units
- Vacuum units
- Amine units
- ULSG units
- Pump cooling water jackets

OIL INDUSTRIES

Pipe flow software helps us ensure optimum circulation for maximum surface contact and cleaning. We own and operate all necessary plant to provide:

Chemical cleaning and pipeline pigging: soda ash washing to remove polythionic acids, and foam chemical cleaning of fin fans, with waste acceptable to refinery WWTPs.

Liquid phase decontamination: using proprietary chemicals to remove organics from pipes, vessels and exchangers.

Vapor phase decontamination: removes oil, gas, LEL, H₂S, benzene and hydrocarbon deposits in a single application.



POWER GENERATION INDUSTRIES

We have undertaken the majority of chemical cleans and in-service boilers in many markets especially when needing to install our other Technokontrol Safety, Efficiency & Security Technologies.

We supply experienced manpower for both day and night work, as well as all necessary plant and equipment, and can arrange effluent treatment and transportation.

Pre-commission cleaning: we offer a specialist team to advise on and provide effective, integrated chemical cleaning for the boiler and associated pipe work in new build power generation plants. Our previous experience on new build HRSG's includes hydro testing all HRSG and balance of plant pipe work.

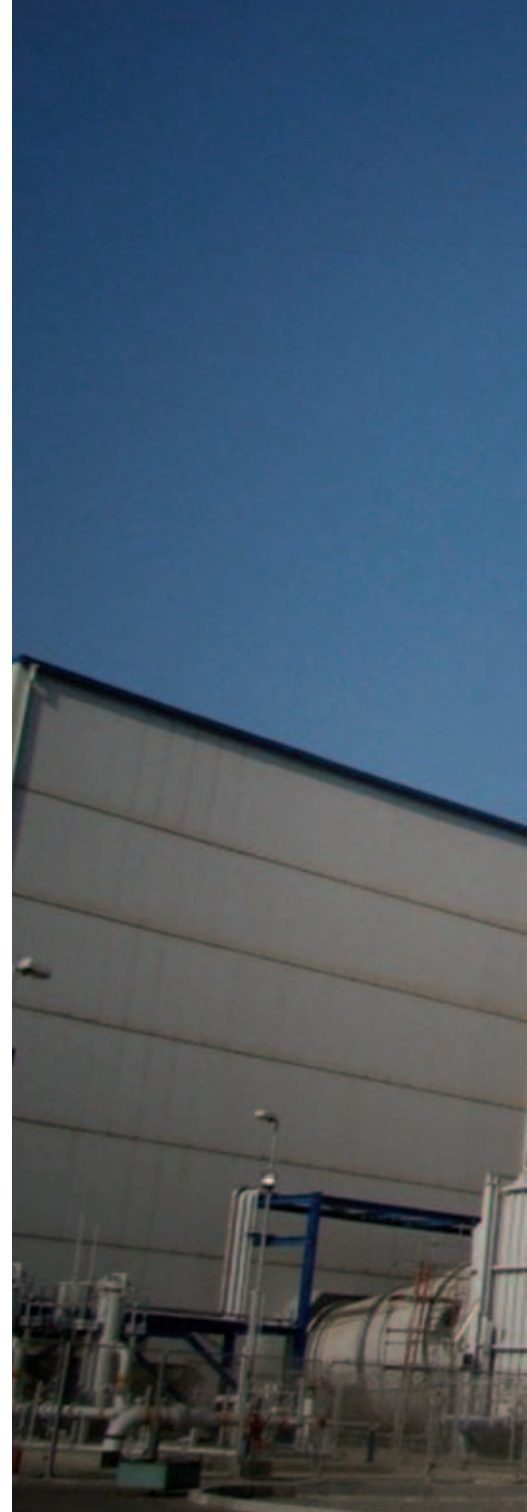
"TK-ENVIRONMENTAL" has carried out pre-commission cleaning on CCGT gas lines including "suction/pigging" new various diameter gas lines from the receiver station to scrubber vessels before the compressor modules. In some cases hydrolasing was utilized to thoroughly clean inter-compressor pipe work before being dried by foam suction or air blowing.



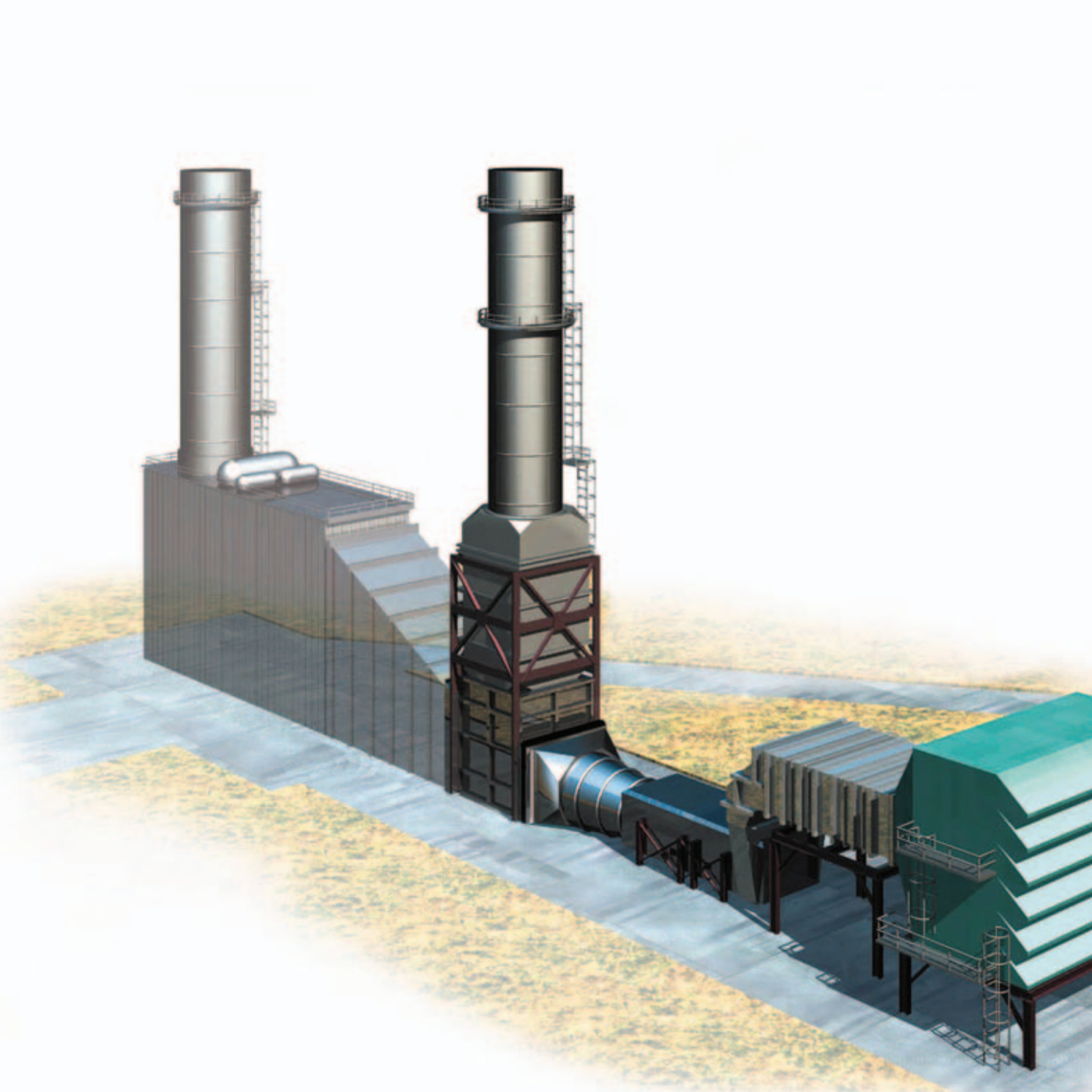
Other clients have also requested cleaning of lines by installing specially designed bursting/rupture discs and pressurizing with dry air or utilizing remote operated quick release valves which we also supplied. Other clients have requests our unique, patented anti-explosion safety valves for refineries, pipelines, pumping stations to become pro-active in environmental safety programs.

Hydrolasing has also been used on steam lines to remove deposits on new build and existing power stations as a belt and braces approach prior to steam blowing. "TK-ENVIRONMENTAL" have also provided and installed large bore temporary pumps and heavy duty plastic pipe work to take demin water to boilers for filling/flushing and transport flushing waters to effluent pits, tankage and cooling towers etc.

In-service cleaning: the deposit of materials during commission and operation will cause a reduction in productivity. Our in-house specialists analyze your requirements, identifying the correct chemicals, pressures, temperatures, flow rates, flushing regime and passivation processes, to develop the right method to deal quickly and efficiently with all deposits/contaminants and ensure the system is in a clean condition prior to use.







TK-ENVIRONMENTAL have used a variety of chemicals to clean HRSG's including surfactant/HF process and the one stage citric acid method. Detailed high velocity flushing is required before and during some of the processes to maximize cleanliness and the effluent can either be stored in 1000 cubic meter "TK-ENVIRONMENTAL" supplied tanks or lined effluent pits prior to neutralization/treatment and disposal of effluent onsite.

A "TK-ENVIRONMENTAL" mobile bioreactor can degrade high COD and ammoniated waste to meet local environmental constraints for disposal of effluent to sewer or river.

Hydrotesting: all planning, manpower and plant for hydrotest work on new-build HRSGs. This includes all temporary pumps, pipe work, water holding tanks, chemicals (ammonia/oxygen scavenger), temporary boilers, high pressure pumps, high pressure pipe plugs, certified pressure gauges/relief valves/chart recorders. Also responsible for designing recirculation systems including vent hoses, pipe manifolds and all flexible pipe work back to the water holding tank/temporary boiler to recirculate and heat water to above 22°C for the hydrotest to take place.

"TK-ENVIRONMENTAL" can also offer sigma froth flushing, silenced steam blowing and air blowing services (including computer design and fabrication) to the worldwide power industry.





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CHEMICAL
ENVIRONMENTAL
PROGRAMS

CHEMICAL ENVIRONMENTAL PROGRAMS

"TK-ENVIRONMENTAL" is highly experienced in providing vacuum services to remove and transfer wet or dry materials in the oil, gas and heavy industry sectors, helping reduce down-time and maximize productivity. We will remove heavy sludge, silt or other viscous material from great depth or long distances, and provide additional filtration and hopper systems to reclaim raw materials.







HIGH-POWERED AIR FLOW VACUUM SUCTION

We operate a large fleet of HGV-mounted high air flow vacuum units which can suck or blow hazardous or non-hazardous materials from vessels, silos, sumps and tanks. We can also offer differently sized portable vacuum units; static 150HP suction units ideal for power stations, down to the minivan, trolley or drum mounted units, all complete with experienced operators

VACUUM TANKERING

We have wide-ranging experience in transporting all classifications of waste for efficient and safe disposal, recycling or re-use. We operate a significant fleet of specialist vehicles ranging from 3,500 liter to 35,000 liter units.

COMBI-JETTING AND SUCTION

Our large fleet of combi-jetting systems utilizes the latest jetting and suction technology to manage any problem from drain clearance up to pipelines four meters in diameter and 2,500 meters long.

Water is a versatile and flexible medium for cutting, cleaning and stripping. Its intensity and effect can be varied almost infinitely; under pressure it becomes ever more potent.

At "TK ENVIORNMENT" we harness this versatility, introducing varied tools, nozzles and temperatures to improve those cleaning capabilities. Water jetting is ideally suited to general deposit removal, process pipe-work de-scaling and cleaning of industrial equipment and pressure vessels, as well as removing coatings and preparing surfaces.

PROCESS PIPE WORK

A comprehensive range of high pressure water jetting services provide remedial and preventative cleaning of process pipe-work to maximize life expectancy and performance. Services include Aquaria, which cleans up to 300m from a single access point with no need to dismantle bends or vertical sections. It is safe for operators, suitable for all diameters and materials, and can completely contain hazardous materials.





HEAT EXCHANGER TRAINS

We are highly experienced in cleaning all heat exchanger components effectively so as to reduce frequency of cleaning, preparation for IRIS inspection, minimize downtime and maximize plant production.

- Freelance: a flexible lance or twin lances, safe for the operator, and semi-automated to reduce operator fatigue.
- Aqualance: more powerful than Freelance, with a rigid lance ideal for hard or bad blockages, and no direct operator contact with lance.
- Bundle Blaster: a fully-automated tube-side cleaning system.



CRUDE OIL STORAGE TANKS

The problems caused by manual cleaning are largely eliminated by the automatic BTS process, which cleans both floating and fixed tanks without the use of chemicals, in a short space of time. The BTS process minimizes tank residues and waste disposal costs and results in high recovery rates for the crude inventory stored in the tank. The system affords high levels of safety for personnel, and is environmentally engineered to minimize hydrocarbon emissions.

The main components are mobile suction and pressure modules, as well as jet washers, with the entire cleaning process underpinned by a special pipeline system with quick-release closures and high-performance filter assemblies. We can undertake cleaning even though there may be high sludge levels within the tank. The complete BTS tank cleaning system is modular and can be installed in road and sea containers for quick transportation and deployment.



PRODUCT TANKS AND PRESSURE VESSELS

Removing product, by-product, scale or corrosion helps achieve maximized capacity, increased throughput, enhanced product quality and improved production levels, therefore offering greater cost effectiveness. We bring unrivalled experience and expertise in tank and vessel cleaning.

Enclosed 2-D and 3-D non-man entry tank cleaning systems enable greater flows and operating pressures to be brought to bear on tank deposits, resulting in superior cleaning results. These remote high pressure water jetting cleaning systems enable you to plan for more extensive cleaning, faster reducing plant downtime significantly.

These cleaning techniques have also greatly enhanced safety by almost eliminating the requirement for vessel entry by cleaning personnel. This offers customers the peace of mind of significantly reducing safety risks such as operator fatigue, as well as reducing the need for atmosphere testing, breathing apparatus, scaffolding, rescue systems and permits.



SURFACE PREPARATION

When preparing surfaces for inspection or new coatings, water jetting offers many advantages over traditional shot and grit blasting (such as no secondary damage, contamination or profiling), and is quicker, safer, cleaner and more flexible.

“TK Environmental” provides an extensive range of specialist services for below-ground pipe work in the industrial and utilities markets. This covers all necessary remedial work, from assessing the condition of assets and identifying problems, to full refurbishments that extend the asset’s working life.



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TK-ENVIRONMENT
& UTILITIES



TK-ENVIRONMENT & UTILITIES

OUR SERVICES INCLUDE:

- Survey and inspection: a comprehensive range of man-entry and non-man entry survey and inspection techniques to locate, identify and classify condition, point of blockage or failure of pipes, vessels and tanks, for pre-planning of extensions, remedial work and maintenance programmes.
- Chemical resistant UV-cured liners for drain rehabilitation: ready-to-use seamless glass fiber tube, saturated with UV light-curing synthetic resin, prefabricated to the exact dimensions of the pipe, in lengths up to 500 meters. We re-line pipes using a trenchless technique to avoid excavation and surface disruption.
- CCTV: leading technology for asset-mapping, analysis and reporting, working in otherwise inaccessible environments, at ranges of up to 600m between access points.
- Sewer and drain cleaning: high-pressure water jetting to achieve free flow in any size of drain or sewer, plus vacuum removal of materials. As well as routine or planned maintenance, we offer round-the-clock emergency services every day of the year.
- Lining and light civilian: lining techniques which rehabilitate damaged or failing assets, to provide years of continuing service requiring no excavation.

HEAT EXCHANGERS PCHE CLEANING

We can descale heat exchangers and associated pipe work utilizing specialist chemical formulations designed for the offshore sector. The removal of hydrocarbon or scale fouling to regain full operational efficiency by means of chemical circulation, sometimes at temperature, has proven very successful. The circulation pumps are easily connected to the exchangers, thus little preparation or dismantling is required.

DECONTAMINATION

We offer liquid phase decontamination, using proprietary chemicals to remove organics from inside pipes, vessels and exchangers. Our chemical technologies separate contaminants from solids and water to reduce, and in some cases eliminate entirely, third-party waste disposal charges cost effectively.





REFINERY-DOWNSTREAM-ENVIRONMENTAL PROTECTION & PREVENTION PROGRAMS

“TK-ENVIRONMENT” success in the downstream oil and gas sector is based largely on building strong, lasting relationships. Not just with people on the ground at the many sites we provide for, but also with the national and international oil and gas companies who own and operate them.

We work at some of the largest and most complex refineries in the world, and are able to deploy large resources of qualified personnel and appropriate equipment at short notice. We quickly develop an understanding of site-specific operating procedures and the unique requirements of often hazardous environments.

This, combined with an understanding of our clients’ wider businesses, helps us continually identify and implement better working strategies and new solutions. These may include proposing alternative access solutions or advancing the thermal insulation specifications to deliver superior performance.

OFFSHORE-ENVIRONMENTAL PROTECTION & PREVENTION PROGRAMS

“TK-ENVIRONMENT” has experience of large upstream oil and gas contracts, providing a wide range of services to some of the world’s largest international oil and gas companies, as well as to smaller, independent operators. Our multi-disciplinary activities focus on the fabric maintenance of later cycle production assets.

The scope and scale of our capabilities means we can provide up to 75 different services as part of one contract, so offering our clients comprehensive support. Our workforce includes multi-skilled teams who perform a wide range of complex tasks safely and efficiently, thus keeping on-board personnel to a minimum.

Specialist and alternative access solutions form a key element of our business, including full rope access capability in all disciplines, tension net systems, work position netting, vertical containment netting and lightweight portable access platforms.



RECYCLING THE D
THE ENVIRONMEN
THE FINANCIAL CO
ENVIRONMENTAL

DAMAGE, SAVING
NT BUT REDUCING
OSTS OF
ACCIDENTS



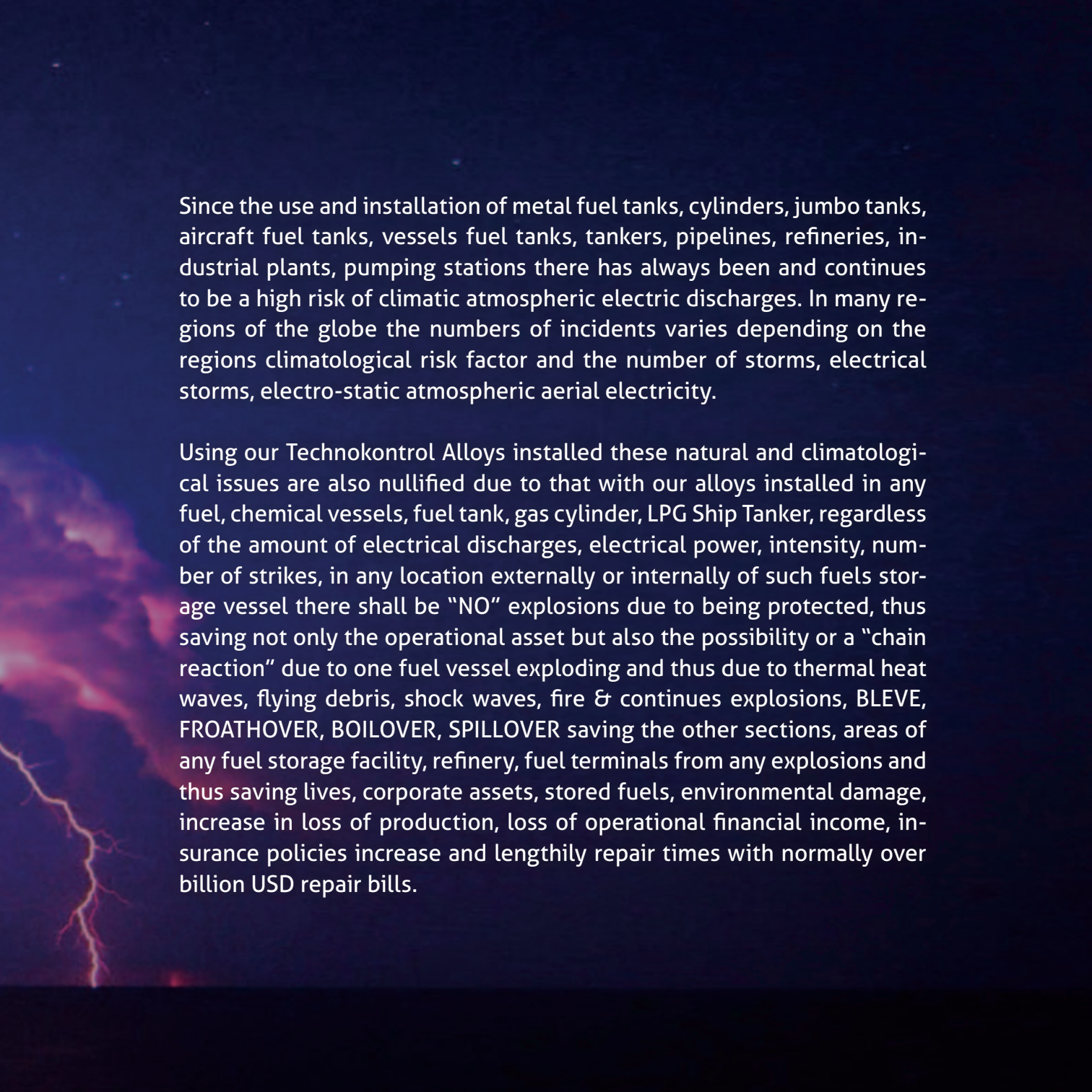
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WHERE EFFICIENCY AND RELIABILITY BECOME A REALITY

TECHNOKONTROL
CLIMATE, ATMOSPHERIC
ELECTROSTATIC AERIAL
CHARGES, CORROSION,
CONDENSATION &
MAINTENANCE
INCIDENTS

A dramatic night sky with dark, heavy clouds and bright, jagged lightning bolts striking down. The scene is reflected in a body of water in the foreground, with a dark shoreline visible on the left. The overall color palette is dominated by deep blues, purples, and oranges from the lightning and the night sky.

CLIMATE, ATMOSPHERIC ELECTROSTATIC AERIAL CHARGES, CORROSION, CONDENSATION & MAINTENANCE INCIDENTS



Since the use and installation of metal fuel tanks, cylinders, jumbo tanks, aircraft fuel tanks, vessels fuel tanks, tankers, pipelines, refineries, industrial plants, pumping stations there has always been and continues to be a high risk of climatic atmospheric electric discharges. In many regions of the globe the numbers of incidents varies depending on the regions climatological risk factor and the number of storms, electrical storms, electro-static atmospheric aerial electricity.

Using our Technokontrol Alloys installed these natural and climatological issues are also nullified due to that with our alloys installed in any fuel, chemical vessels, fuel tank, gas cylinder, LPG Ship Tanker, regardless of the amount of electrical discharges, electrical power, intensity, number of strikes, in any location externally or internally of such fuels storage vessel there shall be "NO" explosions due to being protected, thus saving not only the operational asset but also the possibility or a "chain reaction" due to one fuel vessel exploding and thus due to thermal heat waves, flying debris, shock waves, fire & continues explosions, BLEVE, FROATHOVER, BOILOVER, SPILLOVER saving the other sections, areas of any fuel storage facility, refinery, fuel terminals from any explosions and thus saving lives, corporate assets, stored fuels, environmental damage, increase in loss of production, loss of operational financial income, insurance policies increase and lengthily repair times with normally over billion USD repair bills.



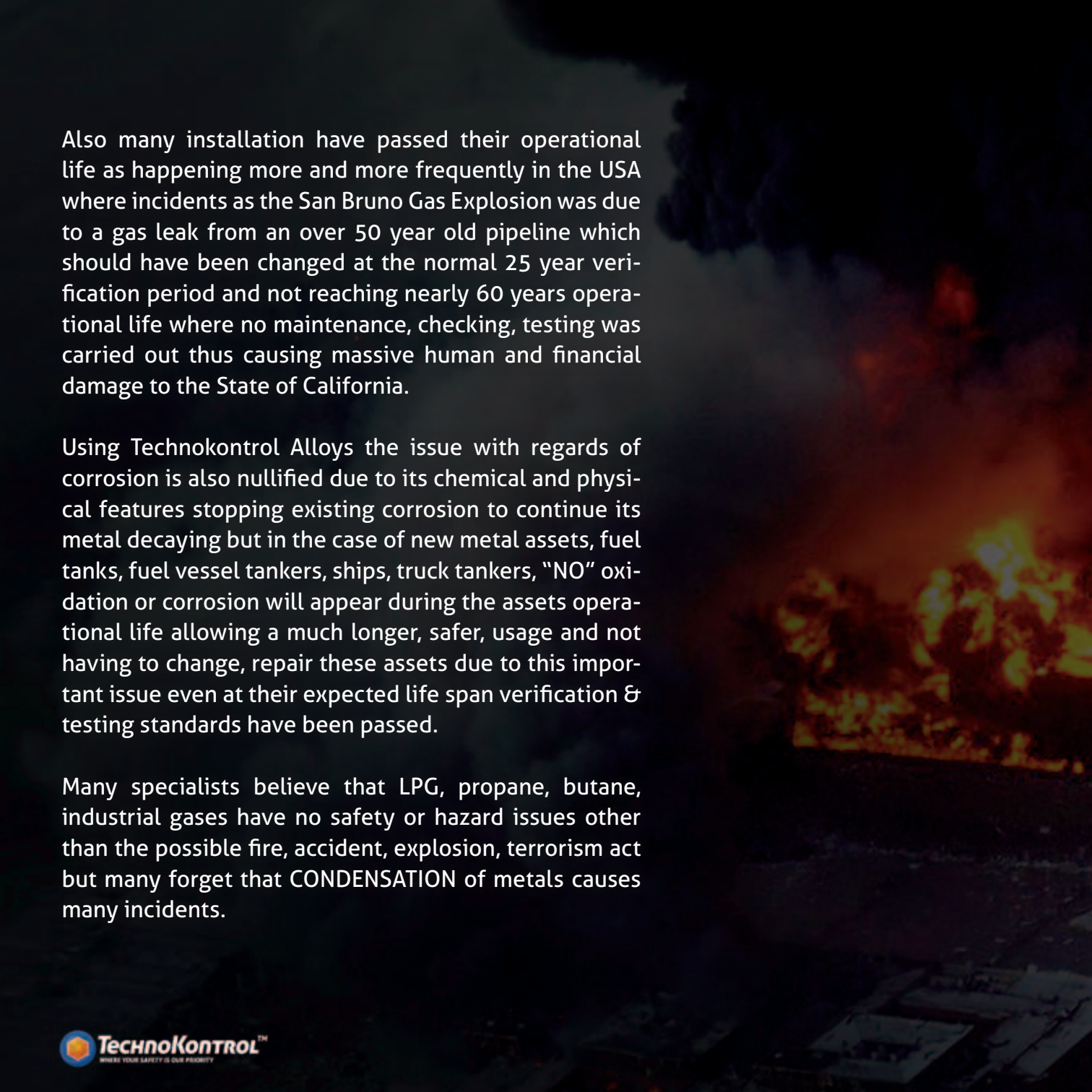




Other natural disaster can be from tornadoes, hurricanes, tsunamis, earthquakes, volcanoes eruptions, all of these aren't controlled by us humans but we can protect all of installations against these natural disasters.

In many cases our safety alloys will protect any installation from external corrosion if found underwater due to a flooding or a tsunami thus allowing the assets to physically protect themselves against any external liquids until the flooding has receded back to its normal course. Sand storms are also extremely damaging to assets due to their continuous friction over the years to which we can also assure the reduction and nullify if such sands, minerals penetrate these storage or industrial facilities.

Corrosion is another great issue with regards to many millions of petrol chemical installations around the world. Corrosion is and will continue to increase its risk factor due to that normal metals as pipelines, jumbo tanks, fuel tanks which in many occasions are located close or next to seaports suffer from "sea salt" corrosion, climatological corrosion, snow areas where salt is used for logistical access and also mainly due to these assets being in the outdoor or in underground contact with humid soils, rainfall, humidity, thermal temperature environment changes during its operational life.



Also many installation have passed their operational life as happening more and more frequently in the USA where incidents as the San Bruno Gas Explosion was due to a gas leak from an over 50 year old pipeline which should have been changed at the normal 25 year verification period and not reaching nearly 60 years operational life where no maintenance, checking, testing was carried out thus causing massive human and financial damage to the State of California.

Using Technokontrol Alloys the issue with regards of corrosion is also nullified due to its chemical and physical features stopping existing corrosion to continue its metal decaying but in the case of new metal assets, fuel tanks, fuel vessel tankers, ships, truck tankers, "NO" oxidation or corrosion will appear during the assets operational life allowing a much longer, safer, usage and not having to change, repair these assets due to this important issue even at their expected life span verification & testing standards have been passed.

Many specialists believe that LPG, propane, butane, industrial gases have no safety or hazard issues other than the possible fire, accident, explosion, terrorism act but many forget that CONDENSATION of metals causes many incidents.



Gases normally stored have the operational issue of changing temperature and in many occasions even freezing externally thus creating an "ice cover" over the fuel gas tank, storage facility, this will continue to increase during its operational life and in many cases the CONDENSATION CORROSION has begun externally due to the de-freezing/freezing of the ice and the condensed liquid dripping to the "Belly-underneath" part of the gas cylinder, fuel tanks, gas tank, storage tank and during years this corrosion will slowly penetrate from "outside to within" via the corrosion of the metal at this weak point and thus being extremely easy to explode or to ignite.

This also occurs internally where the gases also reach extreme low temperatures even due to climatic reasons as the vessels physical location and the cold gases create internal condensation which also falls at the bottom "belly-inner part" of the fuel or gas tank thus again having two different corrosion fronts, externally and internally and then increasing the speed of corrosion and reducing the operational life of the storage facility with the continuous risk of ignition , leakage, explosions, fires, gas atmospheric leaks, etc.

Finally, using Technokontrol Alloys, Safety, Security and efficiency technologies all of these issues will be nullified and will not only increase asset operational life but in many types of vessels reducing vaporization, atmospheric contamination, the risk of fire, explosions, terrorist attacks but also having the advantage of being able to repair many of these assets due to being able to use a naked flame, welding systems without the need to unload, discharge the stored fuels or chemicals due to the Technokontrol Alloys paramount and unique safety features.







TECHNOKONTROL
INDUSTRIAL CHIMNEY
FILTER RECYCLING
SYSTEMS

ANTI-CONTAMINATION CO₂,
CO, SO₂, SO₃, SO₄, NO_X
INDUSTRIAL CHIMNEY FILTER
RECYCLING SYSTEMS



Technokontrol Chimney Filtering Systems has also developed the technology and products not only to increasing output in cooling systems for example, but also to create a filter system in which we can filter all types of fumes, vapors and gases which are contaminating or non contaminating to the environment thus reducing CO2 and other contaminating materials.

The most important issue in today's "pro-environmental world" is not only how to reduce contaminating industries but also how to retain these contaminated materials and to environmentally deal with them in a more ecologically friendly manner.

In today's world, the operators of the respective energy plants not only have to deal with ever increasingly stringent contaminating regulations, but via the use of our Technokontrol Chimney Filtering system they will also learn that it can be financially rewarding to be more efficient and less contaminating.







Our specially enhanced Technokontrol Chimney Filtering systems also offer the opportunity to re-use and recycle these contaminating materials. As after they have been filtered out they do not enter the environment thus providing the possibility to reduce the plants carbon footprint and in doing so, produce a carbon credit. Another benefit is that as these materials are reusable, they can be used again to increase production, hence they do not need to be repurchased and in certain cases be even more environmentally friendly.

Thus via incorporating our Chimney's Filtering system into the above factories, the factories will not only be more compliant to the ever increasing environmental regulations but they also will be a more responsible operator to both present and future clients. Therefore, they will be able to apply for more government and financial benefits and probably more importantly, they will be in good standing with corporate governance of the corporation.

As per above, due to the requirements of each client being different we at Technokontrol will need to design a complete study and custom built application process specially tailored to that respective client. This will include building procedures so as to satisfy the needs and viability of the investment.







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TECHNOKONTROL MOBILE
RECYCLING FILTERING
TECHNOLOGIES

MOBILE-TRANSPORTABLE-LOGISTICALLY OPERATIONAL ANTI-CONTAMINATION/ CO₂-CO-DECONTAMINATION/ RECYCLING FILTERING TECHNOLOGIES

Technokontrol Environmental Mobile Chimney Filtering & Recycling Systems have also been designed and developed not only to increase the reduction, destruction, recycling of all types of “vapor, fumes, gases, exhaust” emitted, expelled from all types of industries as power plants chimneys, energy transformation exhaust systems, petro-chemical flame/gas arrester fumes, gases, vapors, all types of refineries for example, but also to create a mobile, logistical, viable and/or a fixed short-medium-long term transportable filtering, recycling, decontamination systems & technologies in which we can filter, decontaminate, recycle, obtain, retain from all types of fumes, vapors and gases the contamination particulars in such emission which may be of contaminating or non contaminating origin and/ or classified as being environmentally damaging.

MOBILE ECO-GREEN INDUSTRIES

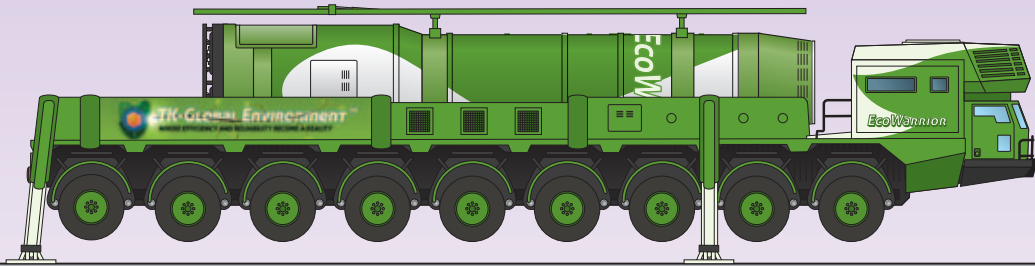
ECO WARRIOR MOBILE



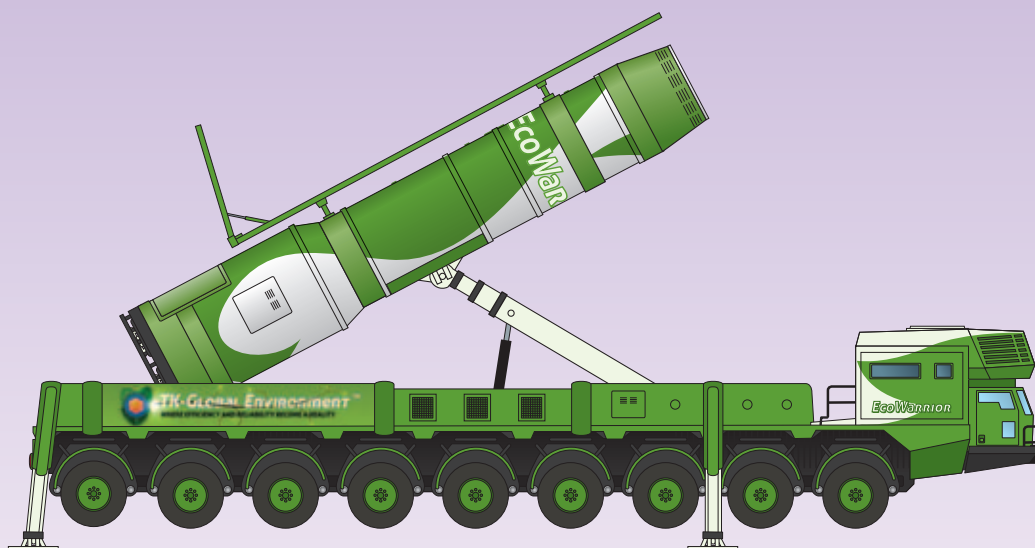
ECO WARRIOR MOBILE IN "PROTECTED CARGO" TRANSPORT MODE



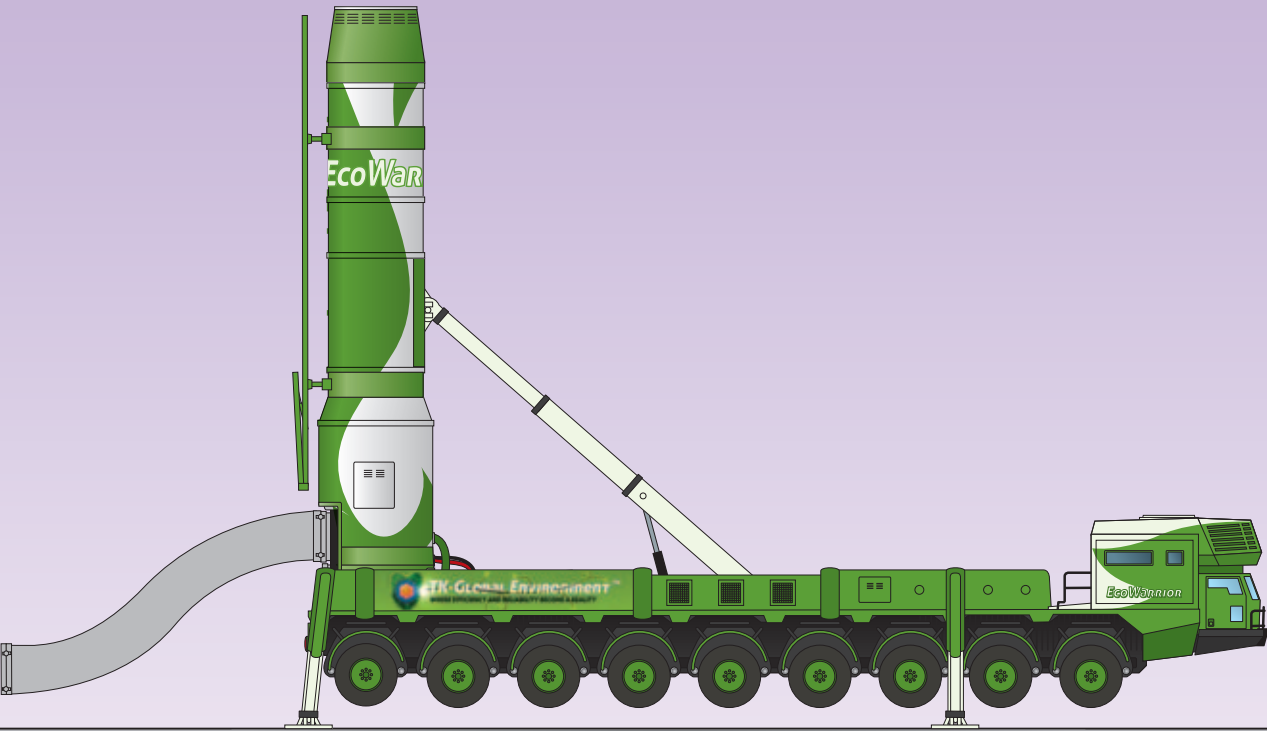
RETRACTILE SAFETY LEGS FOR IMPROVED SECURITY & STRENGTH



EXTENDING CHIMNEY WITH INTEGRATED ARM



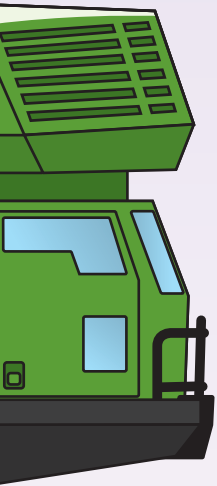
CHIMNEY OPERATION FILTERING FUMES INCLUDING ECO WARRIOR MOBILE'S





Environment™
ITY BECOME A REALITY

EcoWARRIOR



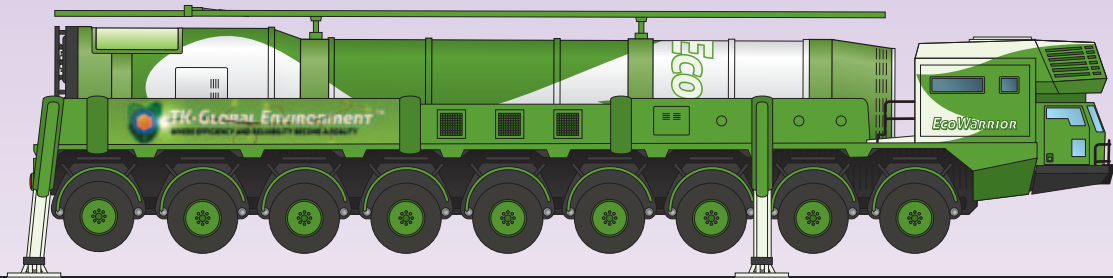
MOBILE ECO-GREEN INDUSTRIES

ECO WARRIOR INDEPENDENCE

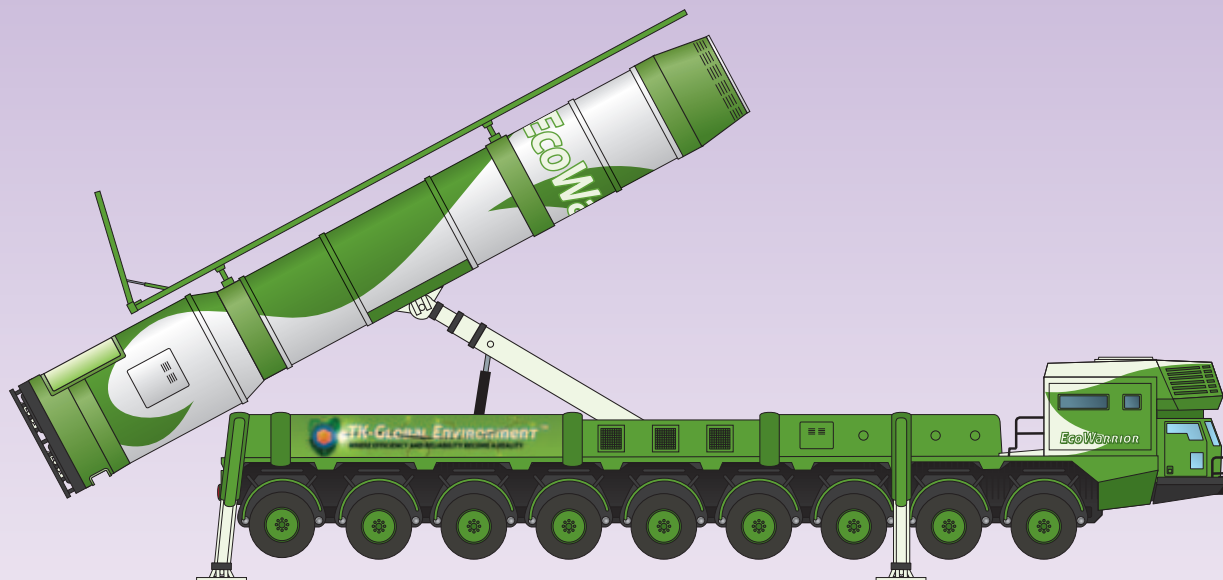
ECO WARRIOR INDEPENDENCE IN "PROTECTED CARGO" TRANSPORT MODE



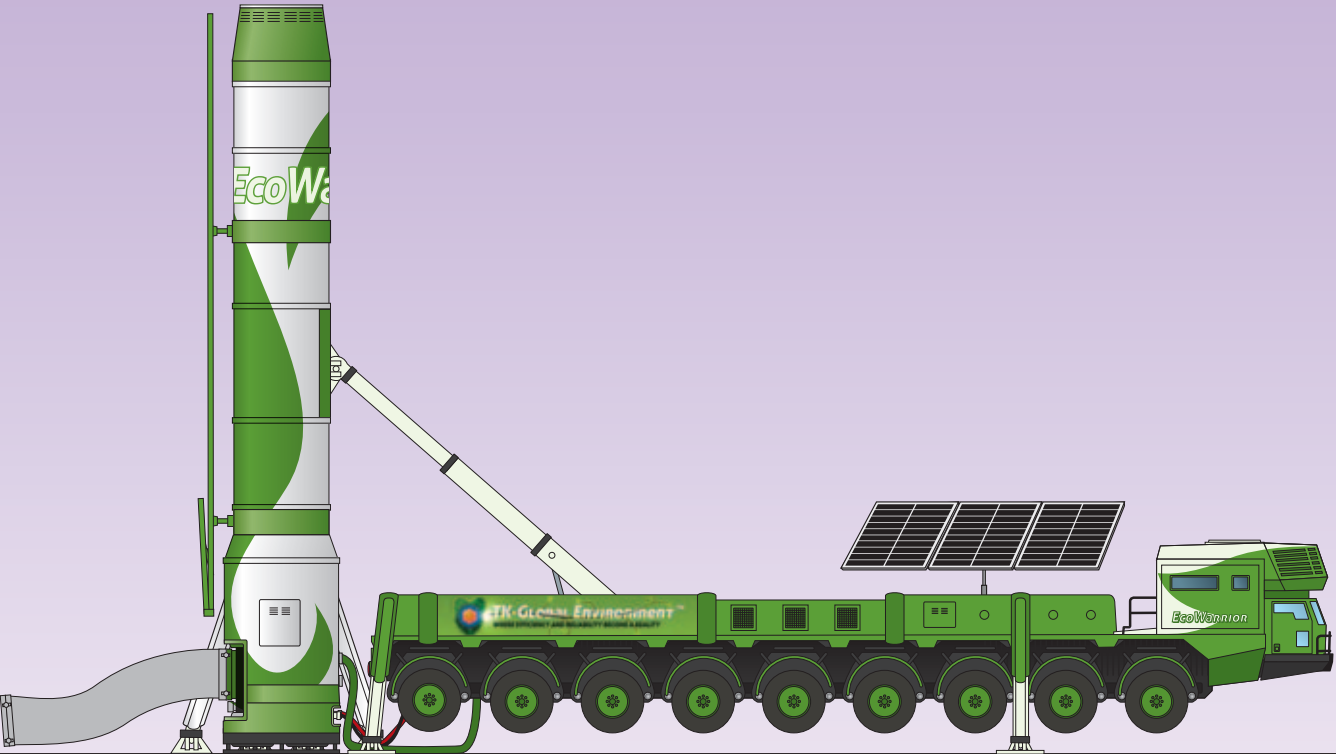
RETRACTILE SAFETY LEGS FOR IMPROVED SECURITY & STRENGTH

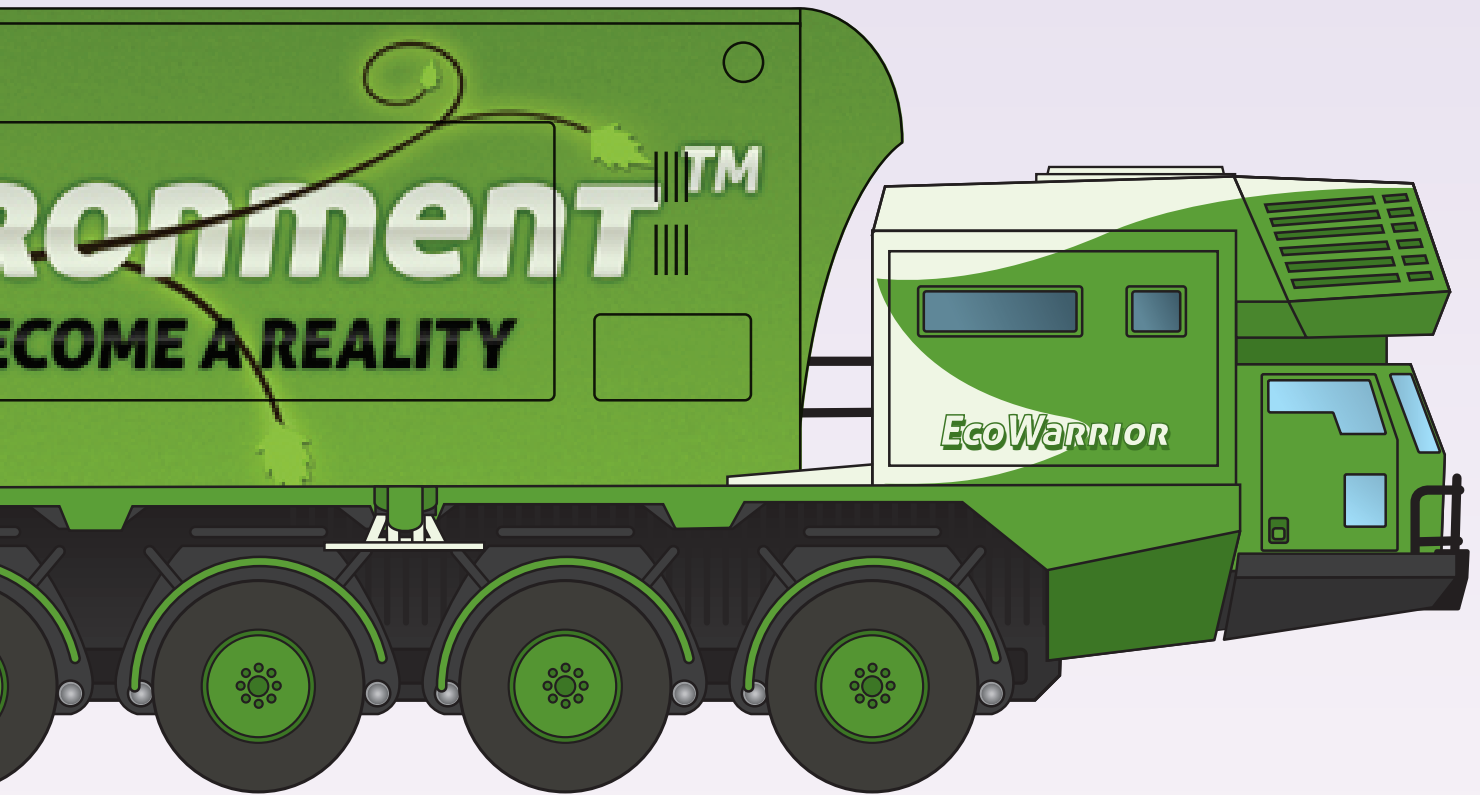


EXTENDING CHIMNEY WITH INTEGRATED ARM



CHIMNEY OPERATION FILTERING FUMES - SELF SUFFICIENT ECO-GREEN SOLAR PANELS SYSTEM





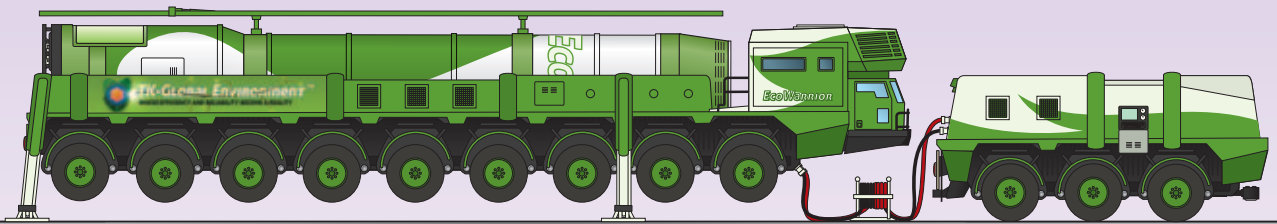
**MOBILE ECO-GREEN
INDUSTRIES**

ECO KING WARRIOR INDEPENDENCE

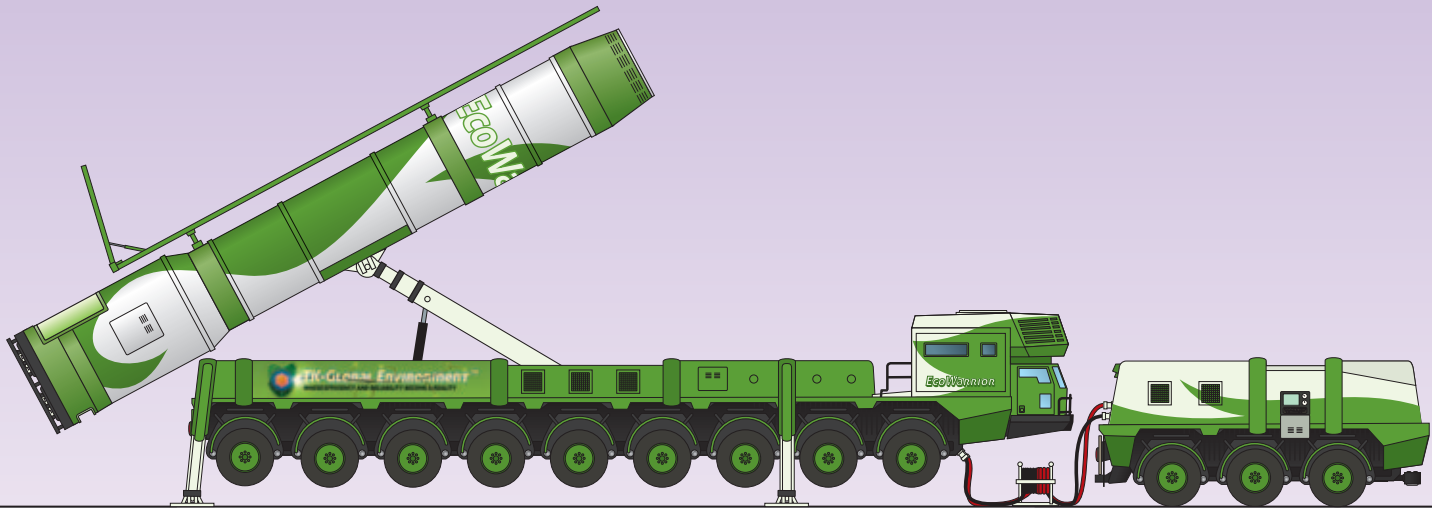
ECO KING WARRIOR INDEPENDENCE AND POWER PLANT TRAILER



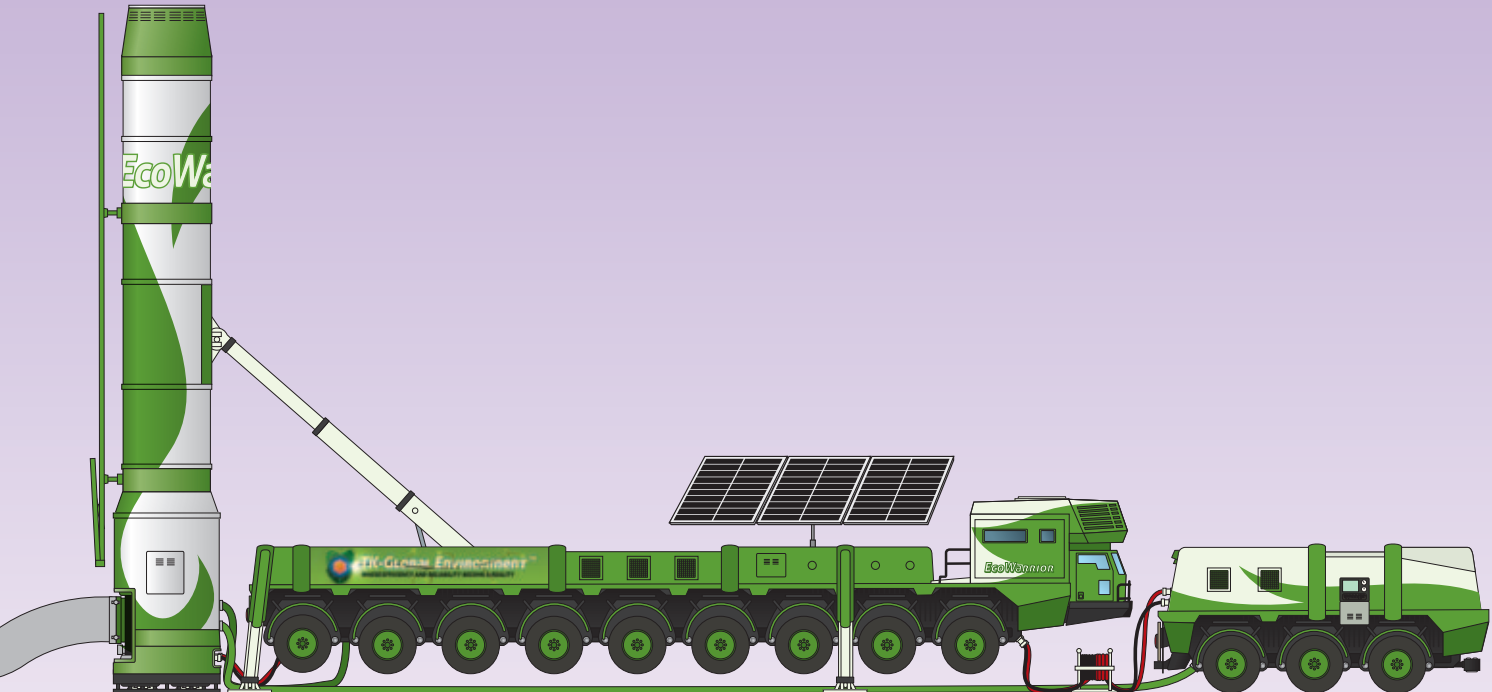
RETRACTILE SAFETY LEGS FOR IMPROVED SECURITY & STRENGTH

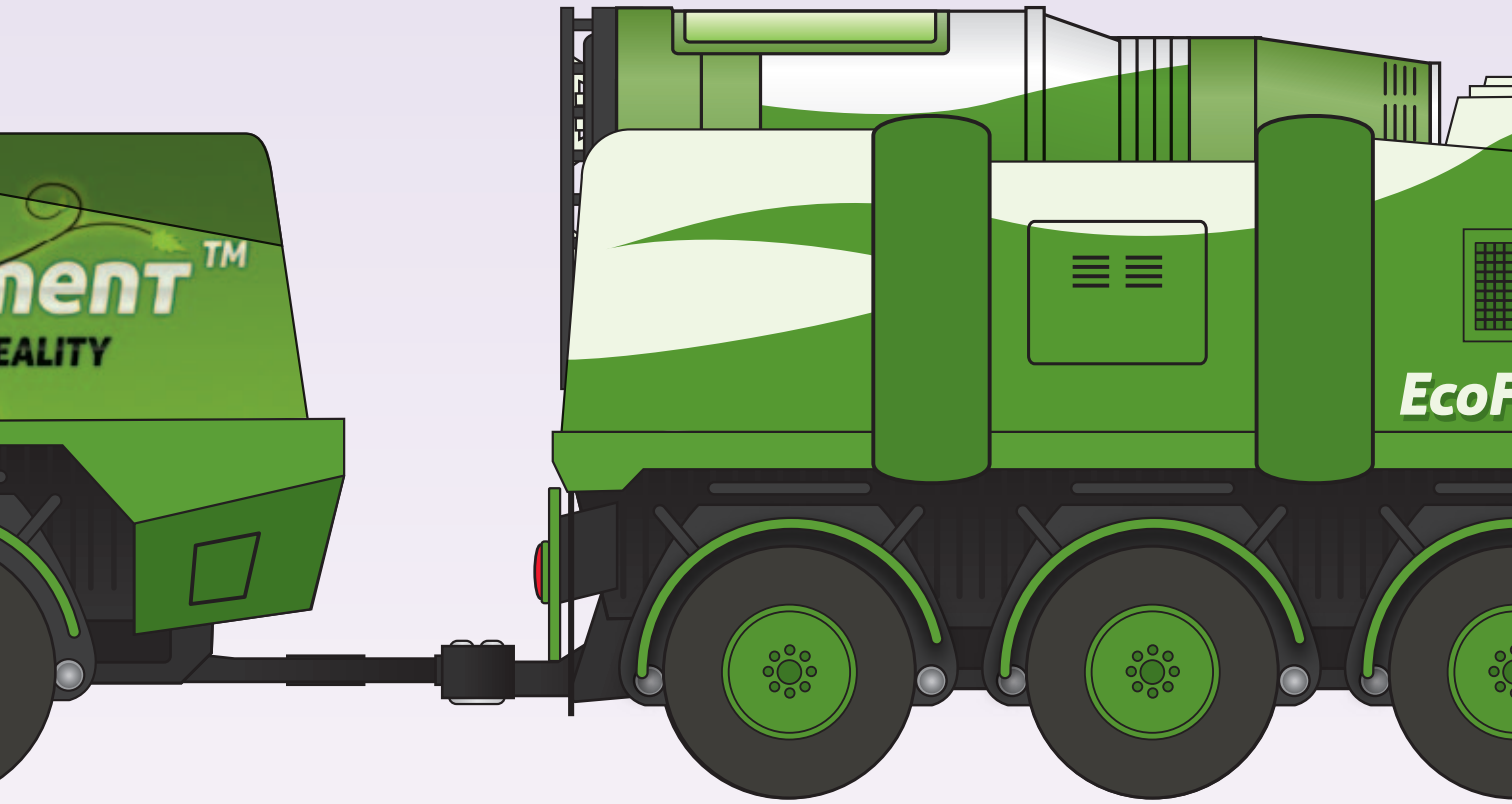


EXTENDING CHIMNEY WITH INTEGRATED ARM



CHIMNEY OPERATION FILTERING FUMES AND THE POWER PLANT SELF-SUFFICIENT ECO-GREEN SOLAR PANELS SYSTEM



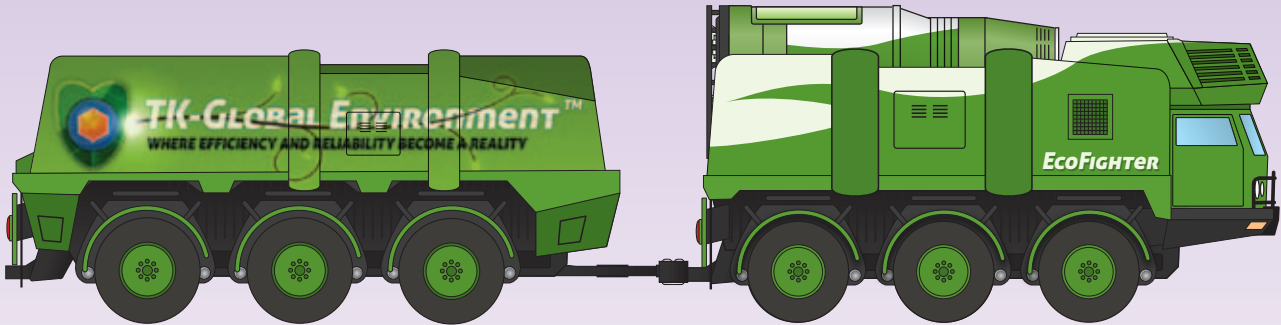




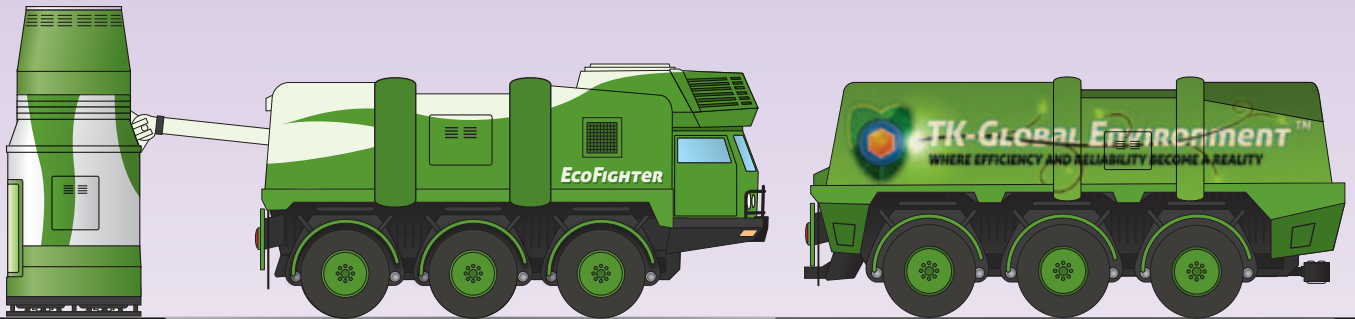
MOBILE ECO-GREEN INDUSTRIES

ECO KING FIGHTER

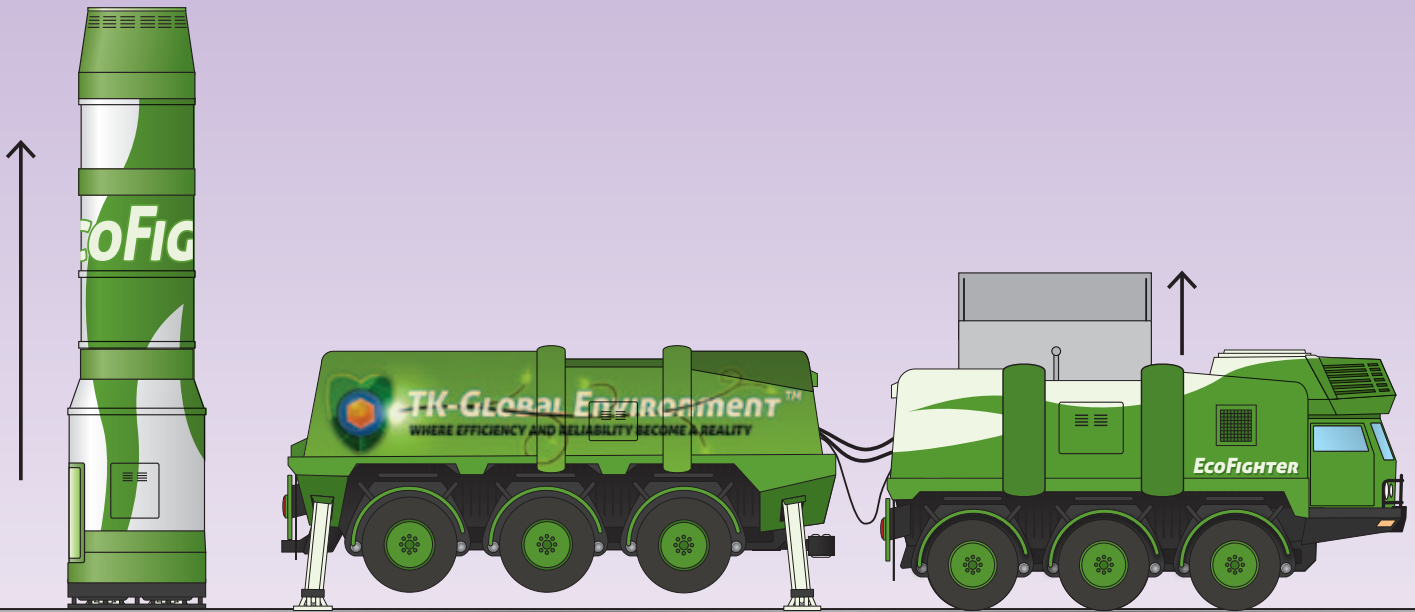
ECO KING FIGHTER WITH EXTENSIBLE MOBILE CHIMNEY AND POWER PLANT TRAILER



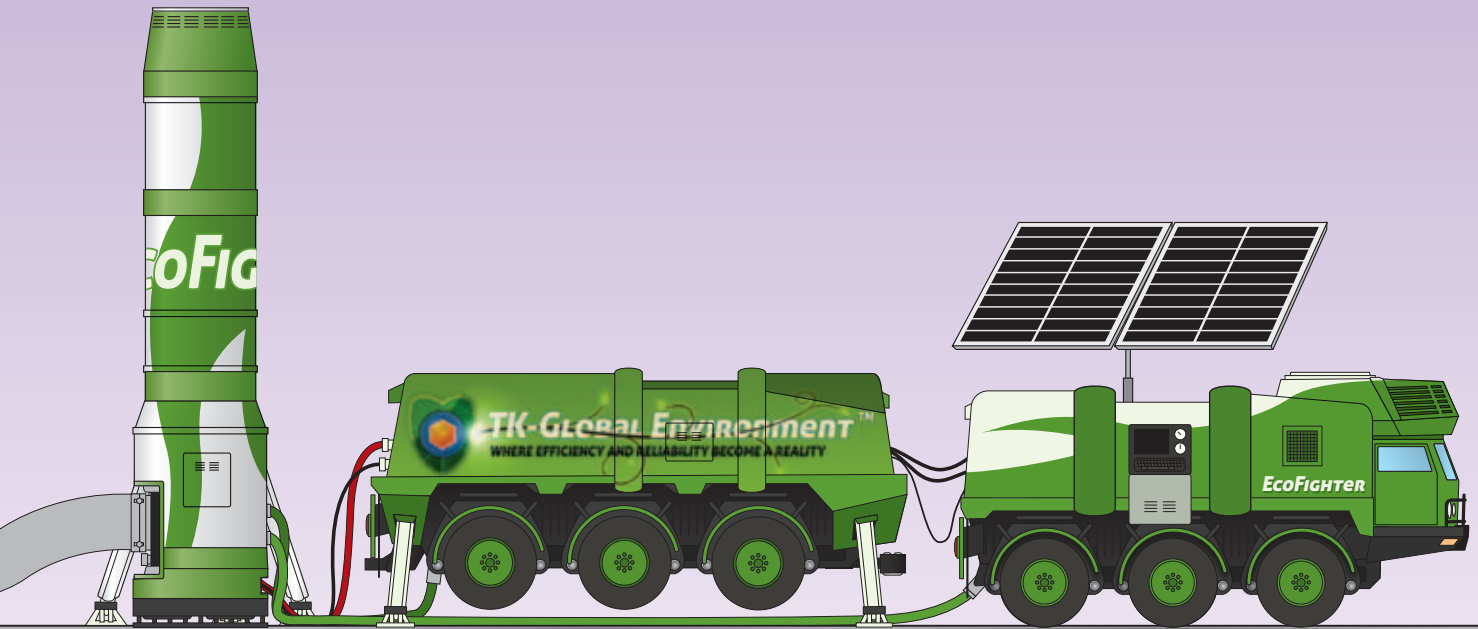
EXTENDING CHIMNEY WITH INTEGRATED ARM



UNFOLDING CHIMNEY - RETRACTILE SAFETY LEGS FOR IMPROVED SECURITY " STRENGTH - ECO KING FIGHTER DEPLOYING SOLAR PANELS



CHIMNEY OPERATION FILTERING FUMES AND THE POWER PLANT SELF-SUFFICIENT ECO-GREEN SOLAR PANELS SYSTEM





Thus reducing, recycling, decontaminating partially or fully up to 100% of all CO₂, CO, and other types of chemicals expelled, emitted from these industries as chemicals known as SO₂, NO_x, SO₃, and other kinds of visual, sensorial, health related contaminating materials which can be expelled into any airborne, water based, filtering levels, which the outcome will be environmentally devastating at short, medium or long term not only to the environment but also to any living species including the human race.

The most important issue in today's "Pro-Environmental World" is not only how to reduce contaminating industries but also how to retain, obtain, contain and recycle these contaminated materials and to environmentally deal with them in a more ecologically friendly manner by recycling, destroying ecologically or re-using them again in the same production systems thus always creating the products one desires without any after effects as would normally happen without these eco-friendly, environmental protection technologies which TK-Global Environmental have designed, tested and making available to any government or industry without great infrastructure changes-investments, design, implementation and/or operational changes.

These specially designed TK-Global Environment Mobile de-contamination, recycling units are designed to handle any size industry as a long term ecological-decontamination, recycling alternative, and or being used in the event of needing cooling towers, exhaust, chimney, extraction repairs or maintenance programs, and having these systems and technologies installed temporarily to not having or needing to shut down partially or fully an operational plant due to any technical, safety or security reasons with these exhaust, chimney, extraction, emissions plant systems including industrial cooling towers maintenance & repairs.

In today's world, the operators of the respective energy plants not only have to deal with ever increasingly stringent contaminating regulations, but via the use of our TK-Global Environment Chimney Filtering Technologies they will also learn, appreciate that eco-friendly high-technology can also be financially rewarding as being a much more efficient and less contaminating industry which will benefit all parties involved.

Our specially enhanced TK-Mobile Chimney Filtering Technology also offers the opportunity to re-use and recycle these contaminating materials. As after they have been filtered out, retained, recycled they do not enter the environment at any level thus providing the possibility to reduce the industrial plants carbon footprint and in doing so, producing financial carbon credits or discounts, etc.





Another benefit is that as these materials are re-usable, they can be used again to increase production, hence they do not need to be repurchased and in certain cases be even more environmentally friendly.

Thus via incorporating our TK-Mobile Chimney Filtering Technologies into the above mentioned production factories, industrial power plants these will not only be more compliant to the ever increasing environmental regulations but they also will be a more responsible operator to both present and future clients.

Therefore, they will be able to apply for more government and financial benefits and probably more importantly, they will be in good standing with corporate governance of the corporation.

As per above, due to the requirements of each client being different we at TK-Global Environment will need to design a complete study and custom built application process specially tailored to that respective client. This will include building procedures so as to satisfy the needs and viability of the investment.



TK-Global Environment™

WHERE EFFICIENCY AND RELIABILITY BECOME A REALITY

TECHNOKONTROL
PROTECTION COOLING
TOWER SYSTEMS



ANTI FIRE/HEAT/THERMAL PROTECTION COOLING TOWER SYSTEMS

TK- THERMAL COOLING TOWER TECHNOLOGIES
AND OPERATIONAL RECYCLING SYSTEMS.

Professionals in all power related industries understand not only the complications and issues but also the paramount importance for the cooling and filtering of heat, fumes and/or gases within all types of industrial plants.

In modern technologies cooling has become an essential influence especially within areas such as the production of electrical energy i.e. thermal processes.

Hence the R&D department within TK-Global Engineering & TK-Global Environment have jointly developed new applications using our own specially designed products and patented technologies.



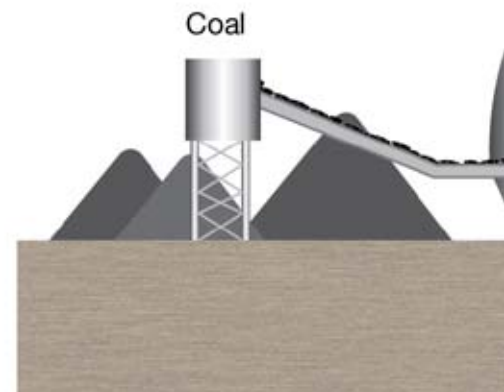
PROCESS

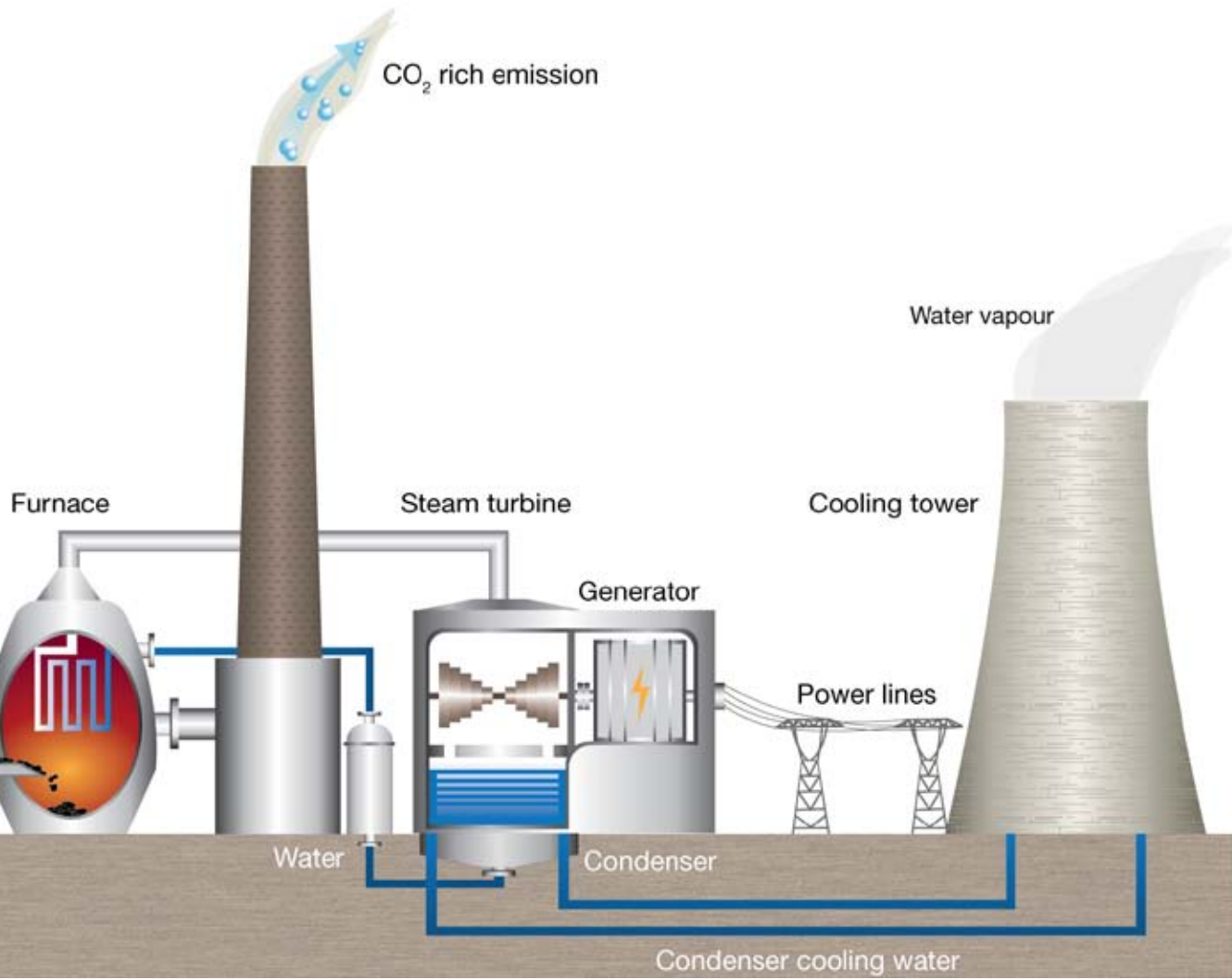
The hot cooling water rains down from the top of the Cooling Tower and is distributed horizontally by various distribution layers.

The cooling air falls on the bottom of the Cooling Tower and returns up to the very top of the Cooling Tower and in this continuous manner the air is heated and the water is cooled down.

In the distribution layers there are distribution units made out of plastic material which have a large distribution surface. The heat transfer capacity of plastic is low (under 1 Watt/m.k²). The cooling of the hot water distributed on the top of the first distribution layer is done via vaporization until the air is saturated and by direct heat transfer between surfaces of the water to the surface of the air.

In some regions especially in the tropics the "Air" which is used in the cooling process contains a large number of impurities like organic seeds and pollen. These impurities stick to the surface of the distribution layers. With the temperature in the middle layers and the humidity they start to sprout and form an organic layer on top of the distribution layers.





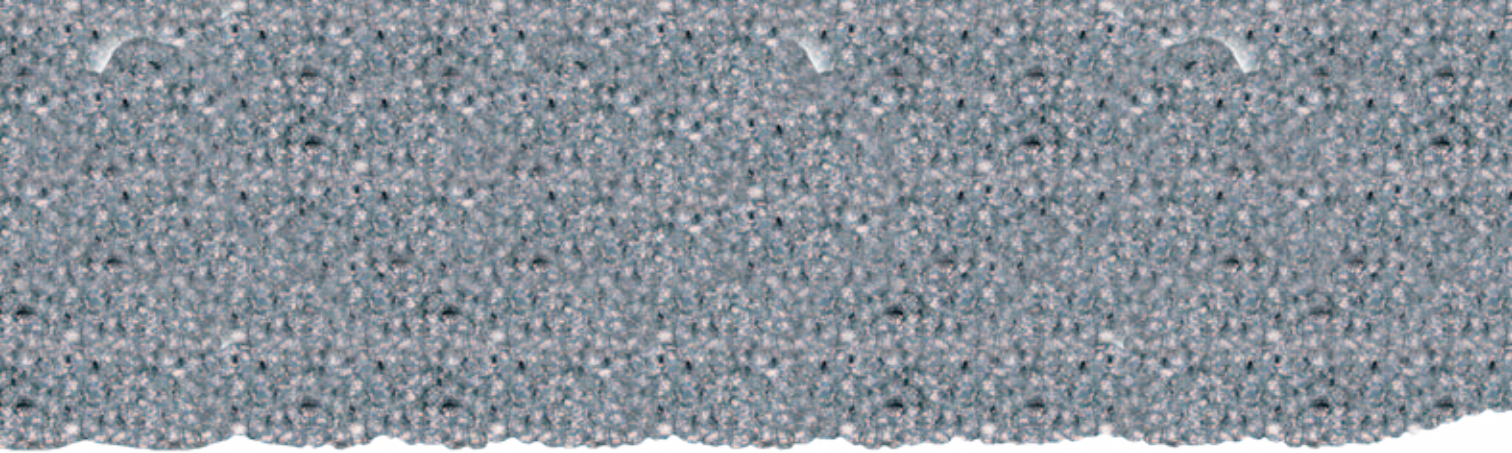
Gradually the efficiency of cooling system starts to be reduced as the air velocity increases or the air capacity is reduced. This is caused due to having less capacity as a result of the impurities reducing in volume.

In this case the operator has to clean the layers of waste, debris or impurities which have become part of the cooling system. This organic layer reduces the available cooling air capacity where the cooling air has to pass through. A reduction of the efficiency of cooling increases the cool water temperature on the bottom and reduces the energy output of the plant. (In humans this would be like having cholesterol in the blood stream and Technokontrol Technologies avoiding the problem from the very start).

TK-Global Environment & TK-Global Engineering Cooling Technologies will avoid these above mentioned issues and will allow the plant to work in a much more efficiently manner thus reducing waste inputted fuel and increasing the net energy output.

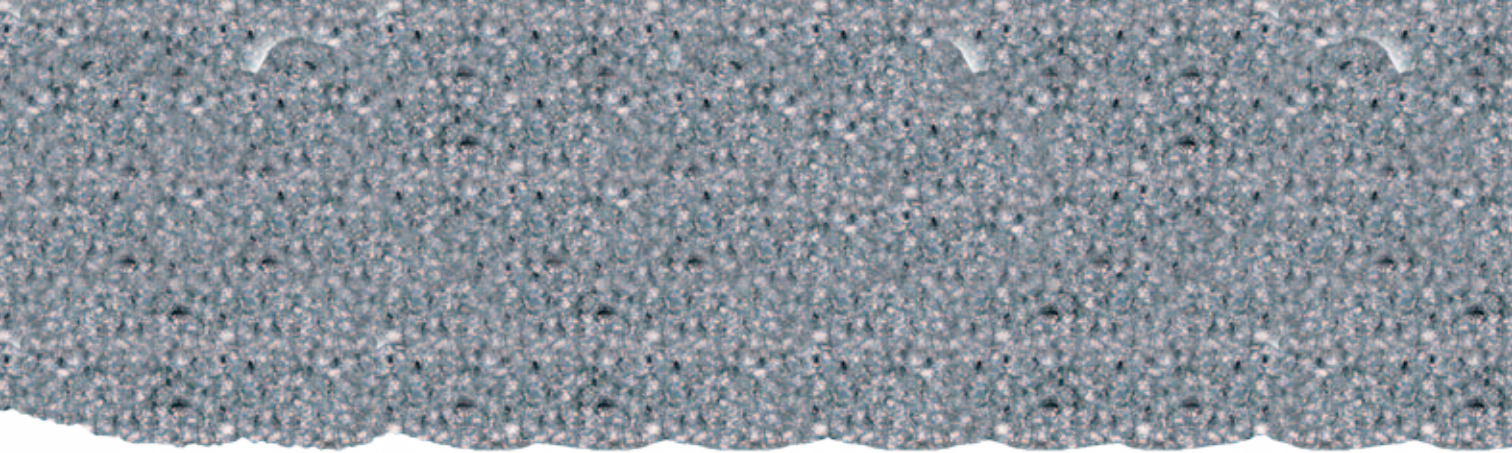
The heat transfer capacity of Technokontrol Cooling Systems is extremely high (202 Watt/m.k²). This effect gives a third component of heat transfer.





The cooling of the hot water distributed on top of the first distribution layer is done by:

- Vaporization until the air is saturated
- By direct heat transfer between surface of the water and surface of the air
- By direct heat transfer of the metallic surface of the distribution layer to the air



The unique and patented alloys installed and implemented into the distribution layers are supported on a substructure system which are isolated against the cooling tower walls. In doing so, a low electric charge is kept in the distribution layer.

The polished surface of the distribution layers together with the low electric charge secure that seeds and pollen would not stick to the surface and even if they did stick they would not sprout as would be the case without the use of Technokontrol Cooling Tower Systems.

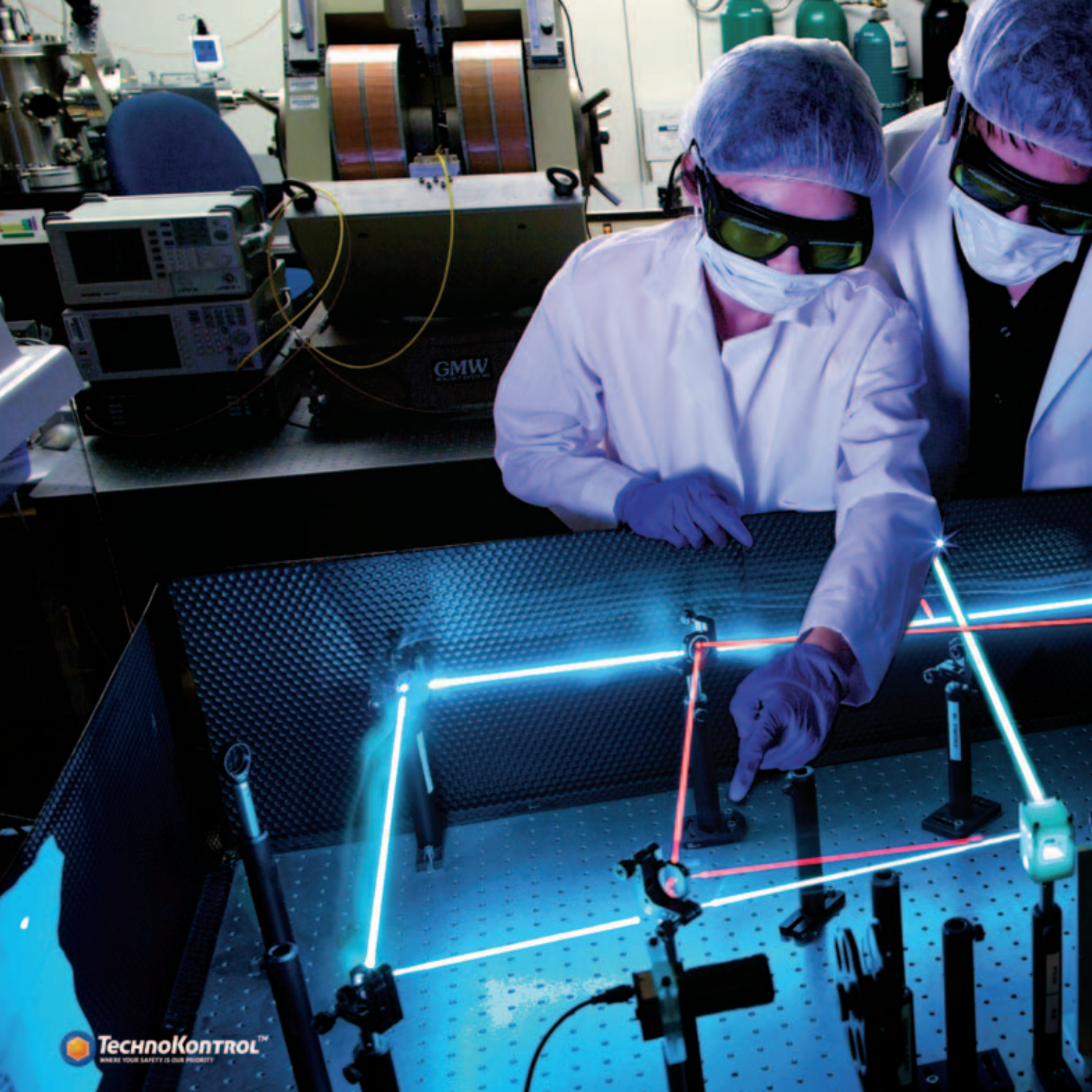
Therefore there will be no reduction of the area where the cooling air goes through, the efficiency of cooling remains constant and no maintenance is required.

The efficiency of cooling depends to a very large extent on the local conditions (humidity, air temperature, impurities in air etc.) and on the specific requirements of the power plant. To reach the best possible results by application of the Technokontrol Cooling system in existing Cooling Towers it is therefore absolutely necessary to make a complete independent Test Program.



The size of the test unit and the instrumentation is necessary so that the data received can be compared with the larger unit, thus creating a test trial to calculate the comparison between the two and adapting the technology directly to the needs of the tower cooling systems.







AIM OF THE TEST PROGRAM

The aim of the Test Program which will be executed by the above apparatus is to determine design parameters, form of the distribution network, amount of water and temperature, velocity of the cooling air and cooling air temperature for existing cooling towers. To obtain the necessary parameters for the apparatus a series of tests have to be made and the respective data fixed in curves.







TK-Global Environment™

WHERE EFFICIENCY AND RELIABILITY BECOME A REALITY

PIPELINES, FRACKING
& PUMPING STATIONS
ENVIRONMENTAL DAMAGE,
SECURITY AND SAFETY
ISSUES

A silhouette of an oil pumpjack is shown against a dramatic sunset sky with orange and yellow clouds. The pumpjack is on the right side of the frame, and its long arm extends towards the left. In the background, there are faint silhouettes of mountains and other industrial structures. The overall scene is dark, with the sky providing the primary light source.

PIPELINES, FRACKING
& PUMPING STATIONS
ENVIRONMENTAL DAMAGE,
SECURITY AND SAFETY ISSUES

BASIC TECHNICAL OF ANY EU OR USA INSTALLED PIPELINE INFRASTRUCTURE

- The most normal pipelines are 24-48 inches(50-100cm) in diameter, 4 feet(1 meter) below the soil surface
- At maximum capacity, they carry 400,000+ barrels per day of NGLs.
- Any route includes land clearing and a permanent easement on either side of the pipeline, typically 50 feet (16 meters).
- Any designated route and installation will include stream crossings, hills, caves usage, tunnels numbering in the hundreds.
- Buildings as pumping stations have to be built and controlled through the pipeline route.
- The risk of criminal, terrorist, accidental incidents are extremely possible and easy to occur as passive or active security or minimum or nil in many cases.

TWO MOST IMPORTANT QUESTIONS AT THIS POINT WITH ANY PIPELINE

1. What are NGLs and what kind of risks are associated with an NGL pipeline?
2. Does the pipeline company have the ability to protect the complete pipeline route?



1.

WHAT ARE NGLS AND
WHAT KIND OF RISKS ARE
ASSOCIATED WITH AN NGL
PIPELINE?

As for the first question, most natural gas extracted from the Earth contains, to varying degrees, low molecular weight hydrocarbon compounds; examples include methane (CH₄), ethane (C₂H₆), propane (C₃H₈) and butane (C₄H₁₀).

Although these hydrocarbons exist in a liquid state at underground pressures, they will become gaseous at normal atmospheric pressure. Collectively, they are called natural gas liquids (NGLs).

As this document explains, NGL "production" has increased significantly over the past few years, going hand-in-hand with the process of hydraulic fracturing for natural gas.

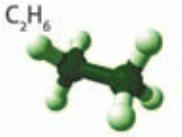
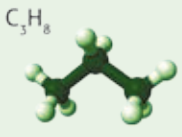
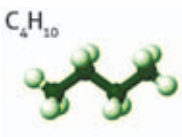
The most common NGL products or components (ethane, propane, butane, isobutene, and natural gasoline) are broken up, or fractionated, and used as raw materials by the petrochemical industry, as feed stocks by refiners in the production of motor gasoline, and as fuel by industrial and residential users.

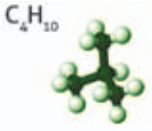
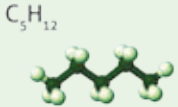




THE TABLE BELOW, FROM THE U.S. ENERGY INFORMATION ADMINISTRATION, CONVEYS TYPICAL NGL CONSTITUENTS AND PRODUCTS

NGL ATTRIBUTE SUMMARY

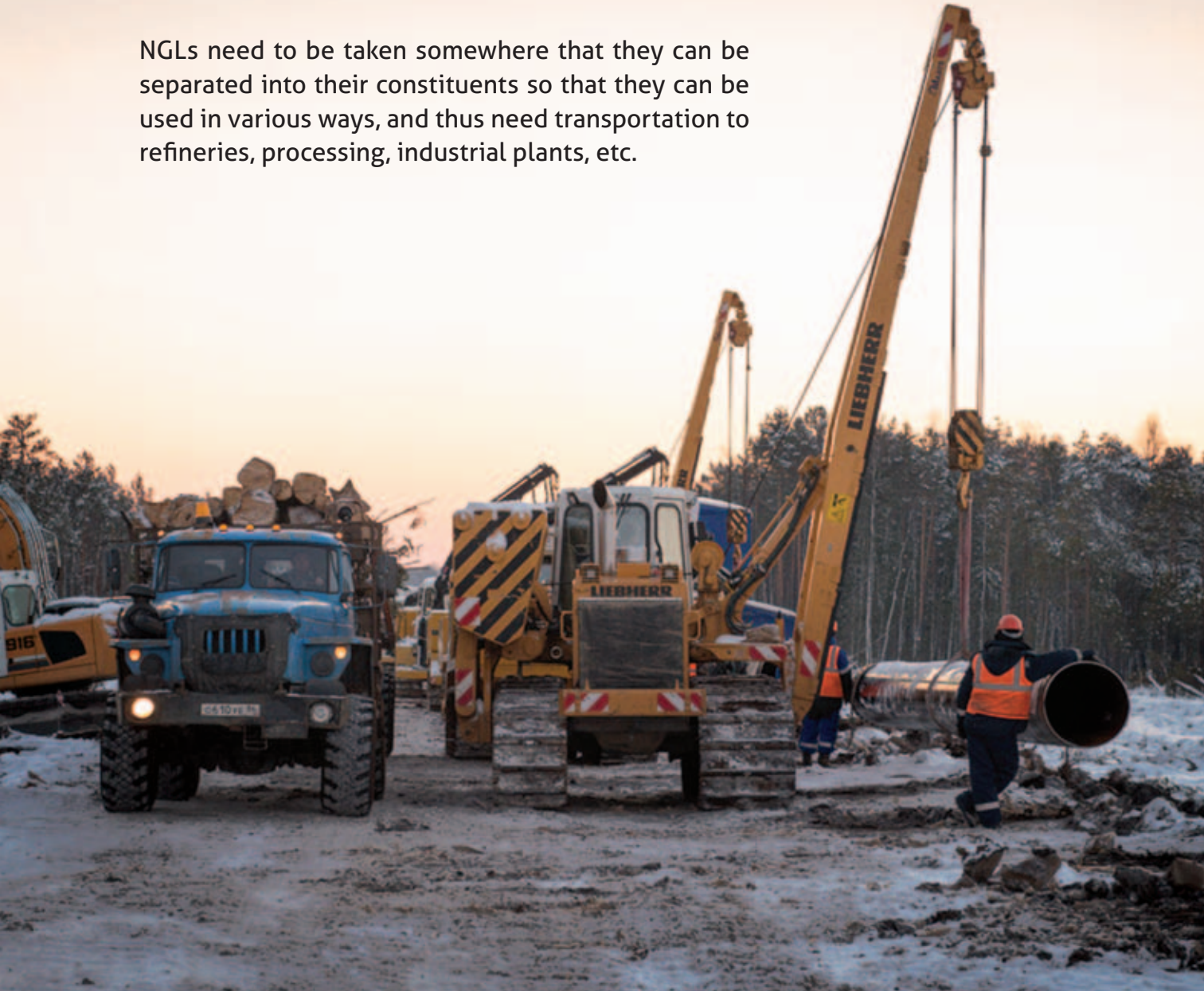
NATURAL GAS LIQUID	CHEMICAL FORMULA	APPLICATIONS	END USE PRODUCTS	PRIMARY SECTORS
Ethane	C_2H_6 	Ethylene for plastics production; petrochemical feedstock	Plastic bags; plastic; anti-freeze; detergent	Industrial
Propane	C_3H_8 	Residential and commercial heating; cooking fuel; petrochemical feedstock	Home heating; small stoves and barbeques; LPG	Industrial, Residential, Commercial
Butane	C_4H_{10} 	Petrochemical feedstock; blending with propane or gasoline	Synthetic rubber for tyres; LPG lighter fuel	Industrial Transportation

NATURAL GAS LIQUID	CHEMICAL FORMULA	APPLICATIONS	END USE PRODUCTS	PRIMARY SECTORS
Isobutane	C_4H_{10} 	Refinery feedstock; petrochemical feedstock	Alkyate for gasoline; aerosols; reffrigerant	Idustrial
Pentane	C_5H_{12} 	Natural gasoline; blowing agent for polystyrene foam	Gasoline; polystyrene; solvent	Transportation
Pentanes Plus*	Mix of C_5H_{12} and heavier	Blending with vehicle fuel exported for bitumen production in oil sands	Gasoline; ethanol blends oil snds production	Transportation

C indicates carbon, H indicates hydrogen; Ethane contains two carbon atoms and six hydrogen atoms.

*Pentanes plus is also known as "natural gasoline." Contains pentane and heavier hydrocarbons.

NGLs need to be taken somewhere that they can be separated into their constituents so that they can be used in various ways, and thus need transportation to refineries, processing, industrial plants, etc.




MAIN RISKS ASSOCIATED WITH NGL EXPOSURE AND NGL PIPELINES

Once a spill occurs, typical petroleum and crude oil are very difficult to sufficiently clean and remove from the environment, and have much longer residence times.

However, as mentioned earlier, once NGLs are exposed to normal atmospheric pressure they become gaseous and much more quickly biodegrade. This does not mean, though, that these chemicals are nothing to worry about from a water perspective, or that there are few risks to humans.

NGLs that stay primarily subsurface can certainly leach into groundwater and cause problems for short time frames. When NGLs become gaseous, depending on the concentration of the gas and the atmospheric conditions, the NGLs can cause breathing trouble (irritation of nose and throat, dizziness, drowsiness, euphoria, disorientation, etc); ingestion problems (gas can enter lungs and cause inflammation and damage); and skin (vaporizing liquids can cause frostbite if too close).





More importantly, these liquids are highly flammable-explosive, and guess what—leaks, ruptures, and explosions do happen. This is an extreme concern. But surely, any pipeline can't locate within a certain distance of a school, or a hospital, or a place of residence? Surely there are laws regarding the placement of NGL pipelines, in order to reduce the impacts to people and resources? There are certainly various laws that the company will have to follow, and permits that must be acquired, but no laws specifically place restrictions on placement of an NGL pipeline.

In addition, the pipeline requires the installation of pumping/compression stations every so often (between 30-100 miles/50km-150km), to ensure sufficient pressure. These pumping/compression stations typical run day and night on diesel fuels or natural gas, impacting local air quality and creating noise issues.

These pumping/compression stations themselves are a risk of fire and explosions. These pumping/compressor stations mostly just fall under the jurisdiction of local planning and development departments.





2.

DOES THE PIPELINE COMPANY
HAVE THE ABILITY TO
PROTECT THE COMPLETE
PIPELINE ROUTE?

As for the second question, one has to know that most petro-chemical corporations do not wish to encounter any kind of civil, legal, PR, environmental issues as people, local and regional governments are willing to claim damages if anything goes badly due to any incident.

However, this doesn't mean that as in any industry there are operators whom are in the business of short term profits and don't really care of any of the issues above mentioned thus putting at risk anything and knowing that any fines, legal battles, environmental, legal payments are worth paying on the long run and which are dragged through any legal process through and the court systems for years and years and trying to reach lower payments to work out in their benefit the profits already obtained.

In many cases these companies should plan ahead and see that creating, designing, installing a well operated, secure, safe and the highest environmental project maybe be less expensive than they could imagine and not only investing through those initial funds into the project but also making the whole project safer and allowing any applications being approved easier at local, regional, state level which can only mean a better reputation for future projects as their incident rates will be as low as possible creating a great PR backup and credibility when they apply for future projects as the people, citizens, affected persons will only see good company governance and good will which can only be "earned" and not "bought" regardless of any short cuts they believe they will gain by short profit planning against a long term secure project.

The last point is also the ethical, morale grounds that anyone should stand on and especially knowing of the possible damages of any strategic, dangerous, environmental complex industry as the petro-chemical industry which can so easily go wrong and we believe that one's personal and professional bases should be applied for oneself and then to the rest and this surely will reduce of any mal practice, quick profit scenarios when really we are only leaving behind what we have invested and sooner or later everything comes back and a greater level and not really being worth it.









Efficiency, productivity, financially viable businesses don't mean cost cutting, low quality, dangerous risk planning, it means planning ahead, being the best, being proactive at all levels not only for the company sake but also for the security, wellbeing of all residents, business, future generations.....

Do we want a region, nation with acid rain as in Lagos; Nigeria? Do we want atmospheric pollution which has been recognized by the W.H.O as being "mortal" for our children, families, friends? Do we want oil, gas, chemical explosions-fires, vapor, gas exposures killing our wildlife, countryside, water reserves, our environment?

We should learn from many other nations whom have already done this especially based and operational in Asian-African markets which we should learn from and we can see their already safety, security and environmental issues.





If one doesn't plan well ahead, one day from the largest international petro-chemical corporations to any small sized refinery will be put in front of courts and juries as the "Big tobacco's corporations in the last decades" and they will be sued, fined billions for medical, human costs, loss of earnings, long term illnesses, deaths, environmental damages, thus if they have seen what has happened in other complex industries.









TechCommand Center 5000





Why not being proactive and avoiding these issues with the best possible security and safety technology from the very start and investing now for their own benefit, for the greater valuation of their company, their shareholders, their corporate governance and not end up paying out massive payouts which won't also solve any problems as these funds are directed at personal level or government level and to which will be never be re-invested into finding any real term solutions as illnesses, injuries, health issues and/or environmental incidents can't be put right easily and to which we are lose out when there is already a solution.









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CERTIFICATES





DSEAR

HAZLOC

**Architects
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Section**

JAA



CE



SOUTHWEST



National Fire Protection Association
The authority on fire, electrical and building safety

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