THALES

Security Solutions
for the Oil & Gas Industry

THALES

Thales is a leading international electronics and systems group, serving defence, aerospace and security markets worldwide, supported by a comprehensive services offering. The group's civil and military businesses develop in parallel to serve a single objective: the security of people, property and nations.

Leveraging a global network of more than 20,000 high-level researchers, Thales offers a capability unmatched in Europe to develop and deploy critical information systems. Thales employs 60,000 people in 50 countries and generated revenues of 10.3 billion euros in 2005, with a record order book of over 20 billion euros.

Global Security Solutions
for a Changed World

Global energy demand is expected to rise by as much as 50 percent
over the next 25 years. This combined with depletion of existing oil and gas
reserves will mean extensive exploration and production activities by the oil
and gas industry in the years to come. 75 percent of this increased
requirement is expected to come from the developing world.

Security provides oil and gas companies the freedom to find, develop
and manage assets and to deliver supplies without interference.
Being secure stems from having the correct strategy, translated through
innovative technology into a robust implementation, supported by rigorous
systems management.

With a proven track record in the Oil and Gas industry, the Group
is able to provide - through its Thales SHIELD™ offering, innovative solutions
and services for all parts of the oil and gas industry (upstream,
midstream, downstream).

Thales
Offers Layers
of Protection

Multiple and overlapping layers of protection provide security in a context that is often technically challenging. Thales brings a deep understanding of security in the oil and gas business from the field to the service station.

Security Risk Management defines an adapted security policy and a complete activity recovery plan.

Infrastructure Security includes access control and intruder detection, preventing unauthorised access by individuals and vehicles, supplemented by video surveillance.

Airborne, Ground and Maritime Surveillance protects facilities from threats wherever they may come from.

Supervisory, Control and Data Acquisition [SCADA] Systems manage vital infrastructure and processes.

Cyber Security protects digital information systems from theft, loss, corruption and attack.

Secure Communications Systems allow uninterrupted and untapped voice and data transmission within energy facilities and with operations in the field.

Vehicle and Vessel Tracking, using telematics and fleet management, provides a complete, integrated monitoring and management system for mobile vessels or vehicles in the field and for fuel tanker fleets distributing products to service stations.

Security Operations Centres enable operators to analyse threats, generate early warnings, prepare intervention programmes and manage crises.

Security Solutions
for the Oil & Gas Industry
from Field to Service Station

Exploration and Drilling

As exploration and drilling activities move into increasingly remote and hostile
locations, the need for continuous security increases. According to the US Government
Energy Information Agency, "Areas to Watch" include field operations located in Algeria,
Bolivia, Caspian, Indonesia, Iran, Iraq, Libya, Nigeria, Russia, Saudi Arabia, Sudan
and Venezuela.[1]

For example, in Nigeria during May 2003, local labour disputes resulted in the holding
of nearly 100 foreigners hostage on four offshore rigs for over two weeks.

Personnel access to sensitive zones on the rigs must be tightly controlled to ensure
safety while also allowing freedom of movement for both company personnel and
appropriate subcontractors within authorised areas.

Security of data is as important as physical security. IT access control and secure
global connectivity are indispensable.

[1] www.eia.doe.gov

SECURITY RISK MANAGEMENT. Field operations require risk assessment and development of practical security measurements to mitigate risks. This process requires identification of potential risks, establishment of boundaries, evaluation of consequences and generation of prevention and business recovery plans. Company-wide standard procedures are often supplemented by project-specific or site-specific instructions.

DATA AND NETWORK PROTECTION. Thales offers packaged and customised solutions to protect every level of customer networks from intrusion, using data encryptors, and physical protection devices. This creates an environment of high assurance and secured architectures, featuring secured remote access connections, secured identity management and data protection.

SECURE COMMUNICATIONS SYSTEMS. Customers need a robust and secured communications backbone that connects the exploration site with other company sites. This network uses fixed and portable communication units to enable secure voice and data exchange between groups or individuals.

Other Thales solutions apply as well, such as **Tracking Solutions, Air & Ground Surveillance, Over & Underwater Surveillance,** and **Identification & Access Control.**

Engineering and Development of Reservoirs

The engineering and development of reservoirs are major investments for operators, some costing billions of dollars to complete. Interruption of any kind is expensive.

Onshore and offshore, there are tens of thousands of wellheads and installations with a range of security needs to be evaluated and implemented—from a simple standalone land well to massive complex floating production and storage vessels. Even a simple standalone land well site's risk assessment must consider type of fluids produced, well pressure, directional configuration, measured depth and vertical depth, water access, location, enclosed status, sub-surface safety valve, well maturity and reserves, damage containment, and possible collateral damage.[1]

There is a growing trend towards the use of remote control centres. These require continuous monitoring, with the concept of the digital field wholly dependent on guaranteed secure communications.

CASE STUDY
BP Indonesia

For its operations in West Java, BP use a Thales radar- and UHF-based tracking system, which provides complete monitoring of all vessels within the licence area. The offshore Command & Control centre identifies vessels, detects targets, analyses threats, gives warnings and alarms, and provides navigation assistance, manages logistics and provides incident and intervention management.

[1] "Terrorism and Oil" by Neal Adams, Pennwell Publications

Thales offers a complete solution for intrusion from sea, air and subsea. It is wholly integrated to a Security Operations Centre, which can be either onshore or at an offshore installation.

INTRUSION DETECTION. Protection of the perimeter uses a variety of detection technologies, such as active fences equipped with fibre optic and microphonic cable, to detect vibrations and sound, infrared and microwave barriers, CCTV for motion detection and access control. More innovative and bespoke solutions can also be employed.

AIR AND GROUND SURVEILLANCE. Airborne or ground-based radar monitors the position of any aircraft or ground vehicles, and an alert is issued if an intruder proceeds toward an unauthorised area.

OVER AND UNDERWATER SURVEILLANCE. For offshore assets, over and underwater intruders can be accurately isolated and tracked using radar and sonar sensors.

SECURITY OPERATIONS CENTRES form the heart of any security infrastructure where data is fused, events correlated and warnings issued.

Other Thales solutions apply as well, such as **Security Risk Management, Secure Communications, SCADA,** and **Access Control.**

" CCTV systems provide live pictures, which are transferred via a fibre-optic bus to a main security operations centre. *"*

Pipelines

Terrorist attacks on oil and gas pipelines have occurred in ten countries around the world between 2000 and 2004.[1] Pipelines are the most popular terrorist target, particularly in countries such as Iraq, Colombia, Chile, Ecuador, India and Russia. The motives for such attacks vary considerably. In some cases, the powerful explosive nature is seen to make any attack dramatic and more damaging. In others, energy companies are seen to embody the values of western society. The economic impact of a disabled main trunk pipeline is a serious concern to industry operators and nations.

CASE STUDY
Gazprom

Since the 1980s, Thales has developed and deployed secure IT systems to super-vise more than 200,000 kilometres of gas pipelines in Russia. Gazprom is the world's largest gas producing company. For its Gofo and Yamal pipelines and storage facilities in southwest Russia, the company uses Thales SCADA systems. This customised solution monitors gas transmission and distribution and the gas metering along 40,000 kilometres of pipelines with 750 compressor units, which supply natural gas to former Soviet Union countries and to at least 25 European countries.

[1] Source Lloyd's List April 2005, Energy Focus

8

SUPERVISORY CONTROL AND DATA ACQUISITION (SCADA). Designed to manage infrastructure, this system uses a software platform that provides realtime control, optimises exploitation management systems and forms the backbone of a command, control and intelligence centre.

Thales provides solutions that offer secure encryption to protect data over SCADA communication links, which is vital for critical infrastructure to be properly protected

INTRUSION DETECTION. Intrusion detection and perimeter protection are provided by microphone sensors linked to fences and hyper-frequency sensors. Videosurveillance at key points along the pipeline route can provide pre- and post-alarm digital event recording at central control stations. In addition, Unmanned Airborne Vehicles (UAVs) can help provide monitoring of the pipeline. (See picture above.)

Other Thales solutions apply as well, such as **Security Risk Management, Secure Communications Systems,** and **Data & Network Protection.**

CASE STUDY

Haoud El Hamra

The new Algerian pipeline from Haoud El Hamra, in the oriental Great Erg area, to Oran is more than 750 kilometres long and needed a comprehensive physical security solution for its technical sites. Thales provided the pipeline operator with a complete site security solution, including access control, digital video-surveillance, intrusion detection and perimeter protection systems. All information gathered by the different sensors (e.g. microphonic sensors on fences) are linked to a security operations centre. When there is an intrusion, these sensors send alarms to the operations centre, where they are processed.

Transportation

Oil transported by sea generally follows a fixed set of maritime routes. Along the way, tankers encounter several geographic "chokepoints", or narrow channels, such as the Strait of Hormuz leading out of the Arabian Gulf and the Strait of Malacca linking the Indian Ocean (and oil coming from the Middle East) with the Pacific Ocean and major consuming markets in Asia. Other important maritime chokepoints include the Bab el-Mandab passage from the Arabian Sea to the Red Sea; the Panama Canal; the Suez Canal and the Turkish/Bosporus Straits linking the Black Sea (and oil coming from the Caspian Sea region) to the Mediterranean Sea. These chokepoints are critically important to world oil trade because so much oil passes through them, yet they are narrow and theoretically could be blocked—at least temporarily. In addition, chokepoints are susceptible to pirate attacks and shipping accidents in their narrow channels.

TRACKING SOLUTIONS. Thales has an exceptional pedigree in providing both long-range and short-range tracking solutions dating back to the famous Decca positioning system of 1944. These systems enable the operator to monitor product transport both onshore and offshore. Operators can monitor ocean-going vessels, barges, supply vessels, anchor handling tugs, tanker trucks and other assets from a security operations centre.

Thales has installed vessel and vehicle positioning, tracking and security systems for oil concessions around the world operated by Shell, BP, Total and CNOOC. In restricted operations areas, all vessels (or vehicles) without a tracking unit on board can be identified as a potential threat.

COASTAL SURVEILLANCE. Thales offers integrated surveillance systems to provide full situation awareness based on airborne and coastal radar, AIS sensors and associated security control centres.

Other Thales solutions apply as well, such as **Security Risk Management, Secure Communications Network,** and **Data & Network Protection.**

// Of the 330 security incidents reported in 2004, over 110 were against oil, gas and petrochemical transport vessels, with another dozen against oil field support vessel targets. //

International Maritime Organisation [IMO]

Processing and Storage

Refineries and petrochemical plants are attractive targets for sabotage because of the social and economic impact. Sites must be very secure while allowing effective daily operations and maintenance. In planning a vulnerability and risk assessment, managers need to consider the protection of people, information and property. The list will be long and can include potential problems due to technological failures (electrical, generator, transportation, natural gas, water, sewer, information systems, fire alarms, compressed air, communications, air conditioning, structural, steam or unavailability of critical supplies) or human intervention (workplace violence, chemical terrorism, biological terrorism, hostage situation, civil disturbance, labour action or bomb threat).

12

CASE STUDY

Saudi Arabia Basic Industries (SABIC)

SABIC have twelve petrochemical sites protected by Thales security systems. Perimeter security ranges from four to eight kilometres of fence detection hardware, including microwave detectors and fibre-optic sensors. Each site has carefully arranged CCTV for intrusion detection and gate control, using 60 to 90 cameras per site. High-capacity video recorders supplement the continuous monitoring. Complementing these security arrangements, Aramco refineries have similar high technology systems supplemented by video motion detectors.

IDENTIFICATION AND ACCESS CONTROL.
Thales provides different levels of control for staff, sub-contractors and visitors, using measures such as contactless smart badges that display the user's picture on the guard's control screen during entry and can include biometrics such as fingerprint or face recognition for high security zones. Turnstiles or trap doors allow single person access, using an anti-pass-back function to avoid badges being passed to another person to enter a zone. Badges with limited access rights are also widely used. For vehicle access control, Thales solutions provide licence plate and radiator grid recognition for car authentication to eliminate the risk of licence plate exchange.

VIDEOSURVEILLANCE. The Thales site protection solution includes cameras for surveillance inside buildings, explosion-proof cameras for high-risk zones and day/night cameras. Digital encoding and compression enables the transfer of images over an IP LAN or WAN, while image analysis technology is used to detect abnormal situations, such as people or vehicles in a restricted zone.

Other Thales solutions apply as well, such as **Security Risk Management, Data & Network Protection, Secure Communications Systems, Security Operations Centre, Intrusion Detection,** and **SCADA.**
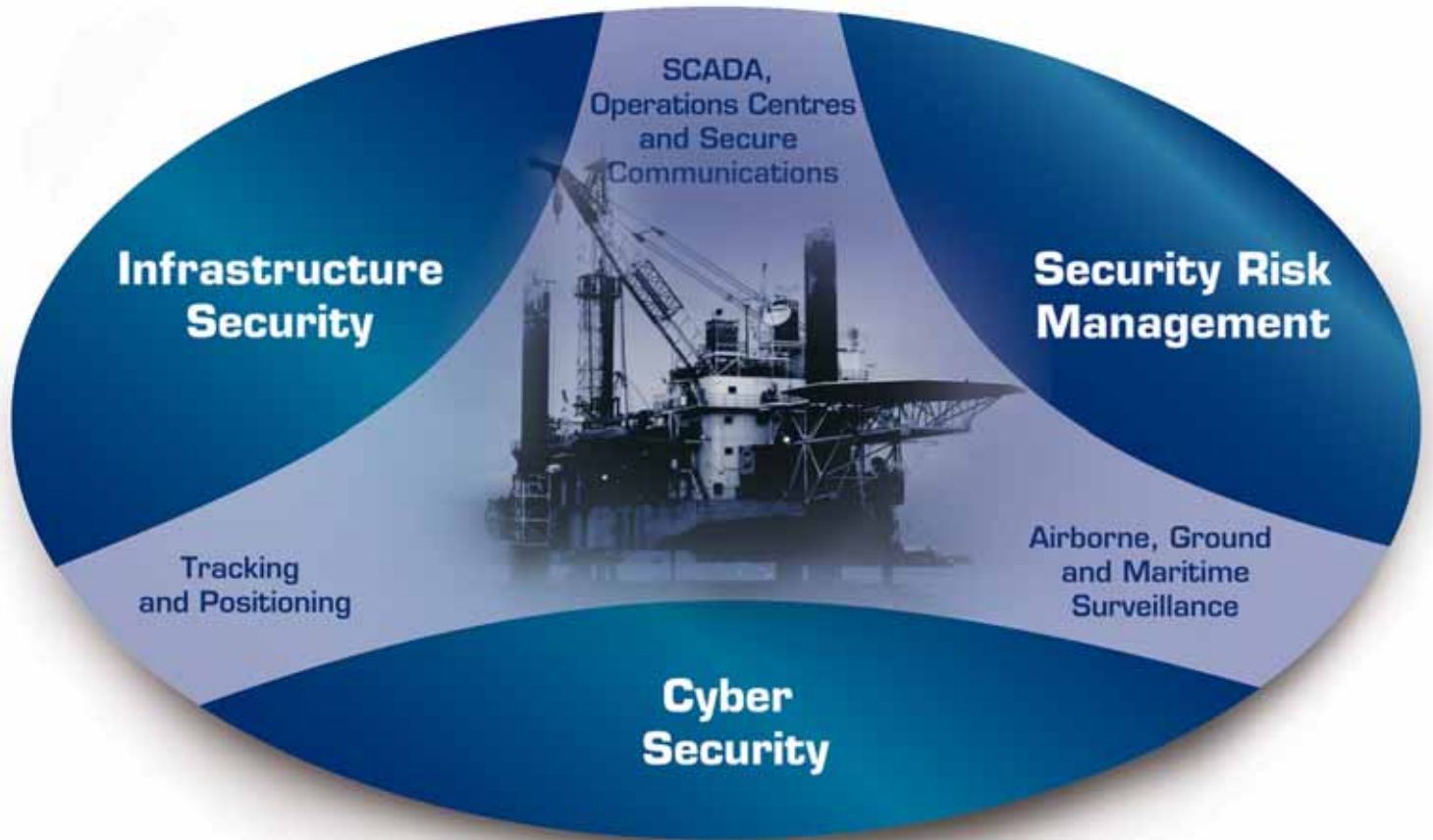
Distribution and Retail Services

The potential is also high for tanker trucks, loaded with flammable liquids to be directly attacked or intercepted while en route to service stations, power stations or petrochemical plants in order to cause collateral damage and disruption to the supply chain. Tankers can also be hijacked and used as a weapon against other targets. The release of hydrocarbons and the resulting fire and explosion could have a devastating environmental impact, especially if any material is released into a river. The consequences would be immense in densely populated zones. At the petrol service stations, theft in the form of customers leaving without paying and credit card fraud are common threats, while protest groups regard these stations as easy targets.

CASE STUDY
Total

Thales integrated payment technology can be found at petrol forecourts across Europe, allowing customers to pay for their petrol directly at the pump. Companies like Total in France and Germany, and Shell in most European countries, use the payment terminals and powerful server-based integrated payment solution from Thales for secure payment transactions at the point of sale. Thales is also a European leader in the field of electronic payment at the attended and unattended point of sale and acknowledged world-wide as a leader in chip card applica-tions and payment security.

FLEET MANAGEMENT. Thales offers specialised telematics hardware and software, which enables provision of a complete, integrated monitoring and management system of the tanker fleet. Vehicle access to refineries and storage areas can be managed using automatic number plate and vehicle shape recognition technologies.

PAYMENT TERMINALS. Thales provides payment terminals and powerful server-based integrated payment solutions for secure attended and unattended payment transactions at the point of sale.

Other Thales solutions apply as well, such as **Security Risk Management, Data & Network Protection,** and **Videosurveillance.**

SCADA,
Operations Centres
and Secure
Communications

Infrastructure
Security

Security Risk
Management

Tracking
and Positioning

Airborne, Ground
and Maritime
Surveillance

Cyber
Security

Thales SHIELD™

Thales Oil and Gas security capabilities is part of Thales SHIELD™.

Thales SHIELD™ is the brand name of the whole Thales Group security and safety portfolio. Thales SHIELD™ encompasses Thales' diverse security and safety capabilities.

Thales SHIELD™ solutions protect borders, people, information and physical assets against terrorism, organised crime, natural disasters and infrastructure incidents.

THALES

www.thalesgroup.com/SHIELD