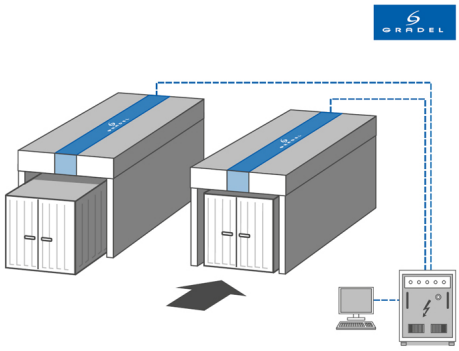

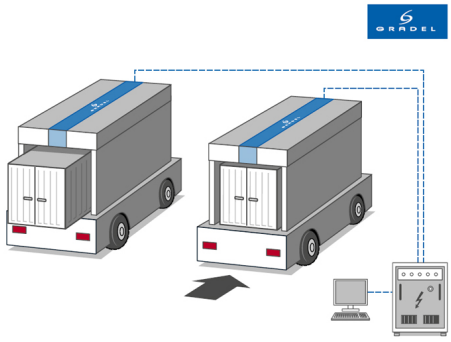

Maritime Container Security

Maritime containers represent a significant part of the international trade and supply chains, which are the backbone to Economy of Europe. Containers transport involves numerous manufacturers, logistic nodes, operators, platforms and check-points (in particular containers ports). Improving their security requires an integrated research and development approach, including risk assessment, traceability, secure exchange between nations and across operators, and fast but effective screening.

The security research of the European Commission is supporting the development of the technologies for container security and supply chains in general. The goal is to develop new security solutions that fully meet the requirements of the end-users and to improve the competitiveness of European economic players.

It is also important to note that the US authorities (DHS: Department of Homeland Security) have adopted new legislation that -- as from 2012 -- would impose a 100% scanning in foreign ports of containers bound to the US. The European Commission continues to advocate the internationally recognised multi-layered risk-based approach including mutual recognition of trade partnership programs for enhancing and protecting the international supply chain. In the framework of this approach, the Commission is ready to work with the US to find possible technological solutions to help address the security concerns linked to container security.

Example: ContainerProbe-Net

The ContainerProbe portal hardware when coupled with a to-be-developed "Data Fusion" system (software & global connectivity) will comprise an overall product solution called ContainerNet. It is designed to be a global system for 100% Risk Screening of inter-modal containers while they are in motion. It will have the following suspected risk screening capabilities:

A ContainerProbe Poster has been submitted to the Cordis/FP7 security partnering web site.

Misdeclared Hazardous Materials:

- Illegal waste exports or imports
- Hazardous materials causing many annual maritime insurance claims
- Accumulated pest poisons

Contraband Materials:

- Smuggled goods to avoid import duties and restrictions
- Narcotic Drugs

- Weapons for Criminals
- Illegal Immigrants

Terrorism Materials:

- Explosives and Precursors
- Weapons of Mass Destruction
- Fissile Materials

The demand for this type of detection capability with high throughput has been declared by the EU, USA and other nations as a consequence of the rising policy of Civil Security.

The statistics of container traffic are daunting. In 2005, there were 85 million containers. By 2024, 243 million TEU (Twenty foot Equivalent Unit) are predicted. Rail carried containers are becoming the dominant mode of transport into and out of ports.

Risk assessment screening of all containers must rapidly process a dynamic global data base of registered information. Precise tracking of containers is a logistics function. Physical measurement is essential to ensure that the contents which start the journey remain the same. Only penetrating radiation can interrogate a container without intrusion; overcoming the limitations of passive radiation detection.

Dependance on x-ray like imaging transfers the risk assessment to human monitors which are proned to erratic performance. Detailed images of all (100%) container contents at a major port has been demonstrated to be economically unacceptable and consequently abandoned.

A very short but intense burst or flash of pulsed neutrons through the container from the NSD neutron generator, which is as long as the container, causes well known Prompt Gamma emissions from the bulk contents. The slow moving containers on a train or automated vehicle at 5 m/s (~20kph) appear effectively motionless. The full energy gamma spectrum collected during the following two seconds provides a profile of the elemental composition of the bulk contents.

The already established ISPS data base for customs and security plus logistical tracking of each and every container in transit will be used by ContainerNet to perform a fast match of content gamma profiles with contents classification. Additional detection of neutrons caused by active neutron "pings" can be used to immediately indicate fissile materials. The transit time within the port provides a buffer for security data base correlations. Transit from inter-modal transport node to node provides further off-line time for deeper background investigations in disparate data bases via ContainerNet. Containers with anomalies to the matching process are diverted to the more detailed scanning systems which produce images and elemental information for analysis of suspected security threats.