The Directive on European Critical Infrastructures (ECI Directive) addresses facility security but does not cover the chemical sector. Some Member States went beyond the minimal requirements of the Seveso II Directive and established additional, security-relevant elements or launched special initiatives that perhaps 80% of the existing safety measures under Seveso-II Directive would also be instrumental in terms of raising security. The Directive on European Critical Infrastructures (ECI Directive) addresses facility security but does not cover the chemical sector.
Preliminary analytical findings regarding the extent to which existing provisions that have been put into existence to advance safety objectives due to synergy effects could be expected advance security objectives as well. To surmise effects could be expected advance security objectives as well. Preliminary analytical findings regarding the extent to which existing provision into existence to advance safety objectives due

Safety and security

The key distinction between safety and security relates to malicious intent.

Preventive safety analysis aims at identifying vulnerabilities in the design and controlling philosophy, in particular situations in which the failure of a single component could lead to an excursion of the permissible design parameters. Preventive security analysis aims at identifying vulnerabilities in the design and acts of malvolence, safeguarding an asset from unauthorized access and acts of malvolence.

Security Risk = Threat x Vulnerability x Impact

In contrast, security is the degree to which protection against damage, loss,

Safety Risk = Likelihood of accident x Consequence

Security is the degree of protection against danger, damage, loss, and crime. For a high-risk chemical facility many security measures will relate and relate to physical protection. For example, in particular situations in which the failure of a single component could lead to an excursion of the permissible design parameters.

The risk of an accident is the degree of protection against damage, loss,

Safety Risk = Likelihood of accident x Consequence

In contrast, security is the degree of protection against damage, loss, and crime.
<table>
<thead>
<tr>
<th>Facility</th>
<th>Facilities with high-risk chemicals present (theft)</th>
<th>Facilities with high-risk chemicals that are targets in themselves (attack)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intrusion response (not required)</td>
<td>SVA</td>
<td>Security presence (not required)</td>
</tr>
<tr>
<td>Personnel vetting</td>
<td>Basic (checklist)</td>
<td>Background checks (employees)</td>
</tr>
<tr>
<td>Inventory control and response</td>
<td>Procedures that identify, investigate, and resolve shortages</td>
<td>Procedures for reporting shortages to law enforcement agencies</td>
</tr>
<tr>
<td>Security plan (prepared)</td>
<td>Security management system (SMS)</td>
<td>Security Report, submitted to authorities</td>
</tr>
<tr>
<td>Perimeter</td>
<td>Fences and gates, access control</td>
<td>Fences and gates, access control</td>
</tr>
<tr>
<td>Vehicle barriers</td>
<td>SVA</td>
<td></td>
</tr>
<tr>
<td>Intrusion detection</td>
<td>Intrusion detection system and alarm</td>
<td>Intrusion detection system and alarm</td>
</tr>
<tr>
<td>(SVA = Security Vulnerability Assessment)</td>
<td>(SVA)</td>
<td>(SVA)</td>
</tr>
</tbody>
</table>

Security framework – selected elements
<table>
<thead>
<tr>
<th>Safety provision</th>
<th>Interpretation of typical scope</th>
<th>Assessment of security elements (potentially covered)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety policy</td>
<td>Example: To prevent accidents and provide adequate control of risks; to provide adequate training; to engage and consult with employees, etc.</td>
<td>Concerns prevention of accidental (unintentional) events.</td>
</tr>
<tr>
<td>Safety Strategy and Control Framework</td>
<td>Typical control elements: management of change (MOC) not to introduce errors into the design; a permit to work (PtW) system to coordinate tasks and manage staff; a mechanical integrity program (including corrosion monitoring); etc.</td>
<td>Concerns prevention of accidental (unintentional) events.</td>
</tr>
<tr>
<td>Hazard Identification and Risk Assessment</td>
<td>The result of a hazard identification is a list of potential concerns.</td>
<td>A hazard identification step is the starting point for a comprehensive risk management framework.</td>
</tr>
<tr>
<td>Inspections, audits, reviews</td>
<td>Typical inspections deal with workplace tidiness, mechanical integrity, corrosion monitoring.</td>
<td>Typical audits relate to adherence to permit to work procedures, if preventive systematic risk reviews have been carried out, if checklists used, procedures before entry into confined space adhered to.</td>
</tr>
<tr>
<td>Typical technical reviews relate to overpressure protection, liquid hammer, adequate capacity of blow down facilities, passive fire protection.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Synergy, safety, security  
8 November 2012

Analytical framework

Safety framework (excerpt) – which security elements covered?

- Land-use planning
  - Good land-use planning keeps communities away from hazardous installations
  - Very clear overlap with security

- Emergency preparedness, response and planning
  - Emergency preparedness aims to mitigate the effects of a release, regardless if it is intentional or accidental
  - Overlap with security (depends on scenario)

- Communication with and information to the public
  - General knowledge enables citizens to take adequate protective measures in case of a toxic release
  - Very clear overlap with security, beneficial both for accidental and intentional releases of toxic chemicals.

Baseline Protection Concept

- Germany has developed a security concept and methodology known as the Basisschutzkonzept (Baseline Protection Concept) which aims to provide guidelines for infrastructure operators to develop protection measures.
- Recommendations focus both on the methodology for adopting protection measures and on minimum protection requirements.
- A sample checklist is provided to assist private sector operators in completing or upgrading their infrastructure protection plans in practice.
- Measures and an minimum protection requirements.
- Recommendations focus both on the methodology for adopting protection measures.

- Which security elements covered?
Security framework (baseline protection concept)

- any safety elements covered?

Basic barrier diagram

A barrier diagram in its most basic form, linking causes and consequences of a toxic release from a high risk chemical facility and marking the precautions related to prevention and mitigation.
Synergy, safety, security
8 November 2012

Analytical framework

Mapping overlaps

Policy level prevention measures
Mitigation measures

Strategic measures

(safety) risk analysis
redundancy: technical, organizational defences-in-depth
mechanical integrity programme
permit-to-work system
management of change
onsite emergency response (limit release)

Chemical safety:

Safety
public aware of danger and countermeasures

Eliminate, substitute
offsite emergency response, evacuation (limit exposure)
to less toxic chemical

Process safety:
inherently safer design, attenuate

Security
process conditions, reduce inventories


Toxic release
loss of containment
(LOC)

Consequences

Equipment
malfunction, human error

Malicious
intent


Vulnerability:

public aware of danger and countermeasures

Land use planning (security) vulnerability analysis
offsite emergency response, evacuation (limit exposure)

restrict unauthorized access
perimeter control
deter, detect, delay
Business continuity
intrusion response (deny)
target hardening

Toxic exposure


safety policy, plan
safety control framework (MOC, PTW)
safety risk assessment
Hazard resolve
inventory shortages
contractor management (evaluation, training, control)
Emergency physical protection, access restrictions
workplace inspections, (security risk assessment)
audits, technical reviews

LUP - land use planning
employee training, instruction, knowledge
personal protective equipment
employee consultations

clear marking of hazards

Major accident hazard legislation
(scope: unintentional events)

Chemical facility security legislation
(scope: intentional malevolence)

Chemical workplace safety legislation
(scope: worker protection)
Thank you for your attention!