Mutual Joint Visit Workshop for Seveso Inspections on Risk management and enforcement for ageing sites

Emergency control systems on ageing sites

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Sites and equipment ageing

There are more than 9,000 high risk sites in Ukraine, among which:

- 655 chemical hazardous sites
- 200,000 tonnes of hazardous chemical substances
  - 3,000 tonnes of chlorine
  - 38,000 tonnes of other hazardous chemical substances
  - 175,000 tonnes of ammonia
Major part of metal elements of these sites has been in operation for more than 40 years.

Industrial equipment of these sites has undergone physical ageing for 10-25%.

Serious hazard comes from the abandoned enterprises with failed equipment or from the bankrupted enterprises which don't ensure proper control over the equipment.

Ageing of this equipment is rapidly growing.
# Sites and equipment ageing

## MORAL AGEING

<table>
<thead>
<tr>
<th>Functional –</th>
<th>Technological –</th>
<th>Operational –</th>
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<tbody>
<tr>
<td>requires adjusting constructional changes due to the availability of new materials, up-to-date equipment, technical maintenance methods</td>
<td>featured with loss of decrease of equipment reliability due to changes of production technology, use of other raw materials, technological environment (temperature, pressure, aggressive substances)</td>
<td>caused by the differences between productive specifications of the obsolete equipment and needs for production enhancement without replacement (modernization) of available equipment</td>
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## PHYSICAL AGEING

loss of equipment original strength (reliability), which is caused not only by its operation, but also by inactivity of equipment (destruction from external, atmospheric influence, corrosion)
EMERGENCY CONTROL SYSTEMS

"human-machine" automated systems, where the processes of automated collection of information on the facility hazard state are combined with warning of the operating personnel of the hazardous facility and responsible persons, state authorities, local self-government, emergency rescue services and population by the human operator.

Compulsory equipment of high-risk objects

EMERGENCY CONTROL SYSTEMS

stipulated by

CODE of Civil Protection of Ukraine

Requirements for EMERGENCY CONTROL SYSTEMS

established by

STATE CONSTRUCTION NORMS “B.2.5-76:2014”
At chemical hazardous sites

concentration in air of gaseous hazardous chemicals (chlorine, ammonia, etc.);
meteorological conditions: wind direction, air velocity, air temperature;
level (amount) of hazardous chemicals in reservoirs, equipment, devices;
leakage of hazardous chemicals;
pressure and temperature in reservoirs, equipment, apparatus, pipelines
EMERGENCY CONTROL SYSTEMS

At explosive sites

concentration of explosive substances and mixtures in the air;

level (amount) of explosive substances (mixtures) in tanks, equipment, devices;

leakage of explosive substances;

pressure, temperature of explosive substances (mixtures) in reservoirs, equipment, devices;
EMERGENCY CONTROL SYSTEMS

In the areas with the risk of natural disasters
parameters of the state of foundations and supporting structures of buildings and constructions;
integrity and relative measurements of geometric parameters of roofs;
relative measurements of geometric parameters of locations;
groundwater state and soil stability.
New EMERGENCY CONTROL SYSTEM in automatic mode controls rising of sulfur dioxide concentration which is formed during its heating, at the early stage stage before its ignition.

Composition of sulfur at the Eastern ore mining and processing enterprise in Zhovty Vody

Previous EMERGENCY CONTROL SYSTEM ensured control over the fire.
New EMERGENCY CONTROL SYSTEM in automatic mode controls:
- air humidity;
- fact of ground braking;
- early stage of the fire

About aging of EMERGENCY CONTROL SYSTEMS

Enterprises for ammunition disposal

Previous EMERGENCY CONTROL SYSTEM ensured control over the fire
In the areas with the risk of natural disasters

New EMERGENCY CONTROL SYSTEM in automatic mode controls:
- subsidence of earth surface;
- transmission of distress messages in case of subsidence of earth surface;
- emergency warning of enterprise personnel and population in case of real threat of object destruction.

Instrumental monitoring of the physical stability of the object's construction using geodetic instruments.
In Ukraine almost 70 % of industrial objects' premises have been operating from 40 to 50 years and are to be compulsory equipped with EMERGENCY CONTROL SYSTEMS.

Objects, equipment and EMERGENCY CONTROL SYSTEMS have the same ageing stages in terms of time and resources, among which physical ageing is dominating in Ukraine.

EMERGENCY CONTROL SYSTEMS may quickly become obsolete due to changes in instrumental base and software.
Thank you for attention!