"Capacity Building and Strengthening Institutional Arrangement"

Workshop: Quantitative risk assessment of oil and gas plants

Working Group n°. 1
"Define main environmental protection issues on regional basis starting from national inventories of oil and gas industries (human risks and environmental concerns) "

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Objective

The working group is finalised to define qualitative human risk and main environmental concerns connected with hazardous oil and gas industries divided according to the regional territory

Activities

1st phase: a) Discussion and debate about previously experiences to define human risk and main environmental concerns connected with the hazardous oil and gas production and activities, performed by EEAA and RBOs

b) Write the criteria adopted by the Egyptian law(s) to define when and/or if an industrial site is classified at “major hazard”

2nd phase: a)Design and complete a table in order to monitor human risk and environmental concerns on regional basis that includes the following aspects:

- The number and the location of all hazardous oil and gas industries in the Egyptian territory
- The main pollutants and hazardous substances produced/stored by hazardous oil and gas industries in the Egyptian territory
- The number of the population that live close these hazardous oil and gas industries
- The main sensible environmental areas (natural park, protected areas, etc.) close to the hazardous oil and gas industries
- The main environmental concerns connected with above mentioned industries
- The main human risk connected with above mentioned industries

Activities

Example of table

Kind of sites (oil/gas plant)	Location/Zone (region/ governatorate)	Number of inhabitants	Kind of settlement (urban, rural)	Quantity of hazardous substances produced or/and stored	Environmental areas	Main environmental protection issues	Main human risk
…… ….	……						
…… ……..							

b) Design a miniature map for each Egyptian region to represent all the oil and gas plants at industrial risk (a legend should be included to report plant's dimension, hazardous substances produced and other possible useful information)

c) Final presentation and discussion about working group's activities

Activities

	Hydraulic conductivity Meters/sec		
Aquifer thickness (meters)	**<10^{-6}**	**10^{-6}/10^{-3}**	**> 10^{-3}**
<=5	0	0	1
5-10	0	1	2
>10	1	2	2

Activities

4th phase: By using Darcy Law **V = Ki/η**

Evaluate:

- Vertical time arrival
- Horizontal seepage velocity
- Propagation Tendency Index for Vulnerable Receptors (PTIVR)
- Propagation Tendency Index for groundwater (PTIGW)

Compare RTI values (estimated in 2nd phase) and the evaluated PTIVR and PTIGW on the two related critical matrices in order to identify safety distance for each category of vulnerable receptor defined in 3rd phase as well as the existence of critical scenario for groundwater.

5th phase: If critical scenarios subsist indicate an adequate protection countermeasure to reduce ground water velocity and mitigate environmental consequences.