THE INSTALLING OF OXIDIZERS ON TEG REGENERATION PROCESS AND THE ADAPTATION OF THIS PROCESS FOR SMALL CAPACITY, REMOTE FACILITIES OF UNDERGROUND STORAGES

Paper text:

1. Introduction:
The dehydration facilities located on the sites of the 12 underground storage facilities designed and operated by Gaz de France in France, exclusively use a process consisting in washing natural gas with triethylene glycol (TEG).

In the dehydration towers, the humid gas encounters a backflow of TEG that absorbs the water. The process is continuous and operates in a closed loop. Water-laden TEG is collected at the output of the towers. It is then regenerated by distillation in a regeneration unit before being injected again into the towers: The hydrated TEG coming from the dehydration towers is first heated in various heat exchangers before reaching the re-boiler, via the distillation column, where it is heated for regeneration. The gaseous effluents given off are evacuated from the distillation column to the flare to be burned. This flare requires a supply of noble gas to ensure adequate combustion of the gaseous effluents. The other effluents (mainly consisting of water vapour and hydrocarbons) are condensed and stored before transport to a specialized plant for processing.

Gaz de France has, for several years now, used a new technique at its underground storage facilities: a heating equipment known as an oxidizer that uses as fuel all the process effluents production, therefore diminishing the quantity of noble gas that has to be used in the process. This device continuously eliminates all effluents while recovering their calorific value, thereby optimising power requirements and minimizing the process's environmental impact.

The combustion of effluents is directly involved in the regeneration process since the energy given off is used to heat and distil the TEG. The principle of regenerating glycol by water vaporisation is the same as previously. The oxidizer represents the present technological step of regeneration units, either for large or for low-capacity production units.

2. Aim of the study:
Cost effectiveness is, however, less clear-cut for small facilities (around 20,000 m³/h of gas). When facilities are installed on remote production installations that are unmanned, the specifications are supplemented by additional requirements. Some conventional low-capacity units, with a burner and a torch, have already been installed on isolated platforms of salt cavity storages. Improving our knowledge of such facilities allowed us to improve oxidizer design by incorporating these new requirements:

- reduce the investment to restore the technique's economic interest,
- reduce fire hazards, and allow detection of fires,
- limit the environmental impact when located in the countryside.

3. Methods:
A project has been developed in this field in cooperation between Gas de France's engineering centre and a Gaz de France subsidiary: PEG (Gaz de France Produktion Exploration Deutschland Gmbh).

This is a skidded and sheltered design. Its compactness provides a confinement that enables optimum fire monitoring.

4. Results:
The following advantages are obtained:

- no need of capacity for storage of contaminated products,
- no deposit, and no road-transport of these products,
- visual impact reduced by the absence of visible fire (flare),
- less noise,
- optimised and thus less costly process.

Compactness is obtained by reducing or suppressing certain items of equipment, required in large capacity centralized facilities with shared regenerators, and by significantly changing the process, so as to simplify adjustments. The suppression of the aforementioned capacities is possible as these facilities are not standardized, and there is only one tower and one regeneration unit each time.

This compactness is obtained, as in the production of heat, by means of process items, which can be confined in a small shelter. This confinement allows the installation of fire and gas detection systems.

The additional advantages are thus:
- a cost reduction compared to an installation with shared regeneration units,
- high quality of remote monitoring of potential fires,
- integration facilitated, as process pipes are all located in the shelter.

5. Conclusion:

This system is suited for:
- remote well or platform,
- unmanned site.

This new type of unit is proposed in France as part of a conversion project named "Trois Fontaines". The conversion of the reservoir into a storage facility was decided on by Gaz de France in July 2005. The design is endorsed by PEG - which has experience in deploying this kind of equipment. If this test proves to be conclusive, this type of unit could be generalised for remote processing, for example the dehydration units on well platforms.