



## **Hibernation of the Castor natural gas underground storage facility enters its final phase**

Enagás has now embarked upon the final phase of hibernation of the Castor natural gas underground storage facility, on schedule and pursuant to the government's stipulations in *Royal Legislative Decree 13/2014 of 3 October adopting urgent measures relating to the gas system and the ownership of nuclear power plants*.

The purpose of the hibernation process is to place the infrastructure in a situation of maximum safety, with no gas at the platform, in the gasline and at on-land facilities. From the outset, at all times Enagás' priority concern has been and remains the safety of people, property and the environment. The first measure taken by Enagás was to close the wells' valves. Throughout the entire process, the company has not carried out and will not carry out any natural gas injection or extraction operations at the storage facility.

As stipulated in the Royal Legislative Decree, securing the facility consisted of a number of phases: a preliminary survey of the asset was performed, the hibernation plan was drawn up, and a start was made on the process in March 2015. The hibernation process is now coming to an end, as maintenance work is carried out on the facility.

Enagás has commissioned the MIT (Massachusetts Institute of Technology) to conduct a survey as a basis for the government to take a decision concerning the future of the facility. The MIT considers the survey will have been completed by the second half of 2016.

### **Hibernation process**

To carry out the hibernation plan as defined, an exhaustive risk analysis was carried out and a number of alternatives considered to reduce the environmental, social and economic impact to a bare minimum and guarantee maximum compliance with safety requisites.

From the technical viewpoint, the hibernation process consists of inertising platform facilities, the underwater gasline and on-land facilities. This involves closing the wells' valves and sealing the facility with steel components acting as plugs. All gas is removed from the surface facilities, and low-pressure nitrogen will be used to inertise gaslines.



The full process involves the following operations: inertisation, closure of wells, remote control of the platform, hiring generators to supply electricity to the platform, emptying chemicals from tanks and conservation of turbomachinery and other equipment that will become non-operational.

### **Next steps**

After the valves of the 12 wells have been closed and the work required has been completed, Enagás will seal the wells as an additional precaution in view of local seismic activity. The process uses mechanical steel plugs to seal the wells at a depth of 1,700 metres under the sea bed and protect the geological structure of the storage facility against possible seismic movements.

This will provide a triple seal for the wells: the plugs inserted at a depth of 1,700 metres under the sea bed, valves at a depth of 150 metres under the sea bed, and the platform valves at the surface (the sea in this area has a depth of approximately 60 metres).

For this operation Enagás hired one of the world's three specialists, the US firm Weatherford.

In the coming weeks the gas pressure of the infrastructure will be reduced to a bare minimum, and any gas remaining will be drawn out to a controlled schedule and burnt off on the facility's flare. When this operation has been completed, the flare will be permanently extinguished. Surface gaslines will then be filled with nitrogen (an inert gas used in gas infrastructures to render them completely safe) as part of the insulation process. This will put the storage facility into technical hibernation.

The ancillary services required to keep the facility safe (fire detection and extinguishing facilities and lighting systems) will remain operational, in addition to other systems to enable basic maintenance to be carried out.

The entire process is being audited and supervised by Lloyd's, the world expert in independent audits of companies working with these types of assets. Lloyd's also performed the preliminary risk analysis.

After the facility has been put into hibernation, the entire dossier with the final documentation will be submitted to the Spanish Ministry of Industry, Energy and Tourism along with the Lloyd's certificate.

The facility ought to be in hibernation by November 2015.



### **Cost**

A preliminary estimate puts the total cost of a safe hibernation process at approximately 17 million euros in 2015. As of 2016 this amount will be much less, since it will not include the costs of the hibernation process.

Most of the investment is accounted for the insurance required and the inherent costs to guarantee safety.

### **Background**

Royal Legislative Decree 13/2014 was approved as a Law by the Spanish Parliament on 16 October 2014, and established hibernation of the facilities and assignment of their administration to Enagás Transporte, S.A.U. (a company owned by Enagás, S.A.). This means that during the hibernation period the company manages maintenance and draws up technical reports and, where applicable, carries out any work that may be required to dismantle the facility.

Pursuant to the aforementioned Law, this measure is required in view of the extraordinary urgent necessity of addressing the complex technical situation of the facility, especially after discontinuation of the concession by the previous owner.

The law also stipulates that the experience acquired by Enagás in the management and operation of underground storage facilities as owner of the main gas system facilities guarantees proper and safe maintenance of the Castor underground storage facility.

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