

Hibernation process of the Castor underground storage facility completed with an extra double seal on the wells

Enagás has completed the hibernation process of the Castor underground storage facility with an extra double seal on the wells, providing additional reinforcement to two other existing valves in each of the wells. In doing so the company has completed the work entrusted by the government in *Royal Decree-Law 13/2014 of 3 October, in which urgent measures are adopted relating to the gas system and the ownership of nuclear power plants.*

By carrying out this work, the company has ensured the safety of the facility – with no gas at the platform, in the gas pipelines and onshore facilities – without altering the structure of the storage facility and carrying out the necessary tasks for the proper maintenance and conservation of the equipment.

Enagás has also requested a study from MIT (Massachusetts Institute of Technology) which will enable a basis to be provided to the government and on which a decision concerning the future of the facility can be made. MIT expects this study to be finalised in the second half of 2016.

Since the beginning of the process, the following phases have been undertaken and completed:

- **Phase 0. Analysis of the situation**

As required by the government, a preliminary study of the asset and an exhaustive risk assessment taking different alternatives into account were carried out; a hibernation plan was drawn up to begin the process in March 2015. The following phases were carried out based on this analysis.

- **Phase 1. Inertisation**

The controlled reduction of the pressure of the gas remaining on the surface was carried out as scheduled on the platform, in the gas pipeline and at the onshore facilities, leaving the infrastructure with minimum gas pressure. As part of the isolation, all of the gas was removed from the surface facility, the lines of which were inertised with low-pressure nitrogen (inert gas used in gas infrastructures to fully secure them).

- **Phase 2. Equipment conservation**

Equipment conservation work was carried out in order to keep it in safe and working condition. Specifically, all of the compressors were retained from both the plant and the

platform; the electrical elements were protected and the valves were lubricated and covered with insulating material to protect them from the marine environment. The process also included: tasks that were remotely controlled from the platform; the rental of generators to supply the platform with electricity; the emptying of chemicals from the tanks and the conservation of the turbo-machines and the other equipment that remain inactive.

- **Phase 3. Sealing of the wells**

Once it was confirmed that each of the 12 storage wells and the valves (both surface valves and those 150m beneath the seabed) were suitably watertight, two mechanical steel parts – one on the valve at 150m beneath the seabed and the other nearer the wellhead on the platform – were installed in each of the wells in addition to the existing valves. This means that the seal on the wells is quadruple.

This work was carried out in order to comply with the instructions of the Royal Decree-Law to not inject nor extract gas in order to not alter the structure of the storage facility.

The auxiliary services necessary to keep the facility secure (fire detection and extinction systems and lighting) and the systems that allow the basic maintenance of the facilities to be carried out are currently in operation.

Safety and auditing

Since the beginning of and throughout the process, Enagás' priority has always been – and continues to be – the safety of the people, of the property and of the environment. For this reason, in addition to the hibernation and well-sealing work, Enagás is also keeping the facility and its surroundings under constant surveillance.

Furthermore, the entire process has been audited and supervised by Lloyd's, the world's most experienced expert in independent auditing for companies who work with these kinds of assets. Lloyd's also carried out a preliminary risk assessment. Once the hibernation process has been completed, the whole of the final documentation dossier with a certificate from Lloyd's will be presented to the Ministry of Industry, Energy and Tourism.

Background of the process

Royal Decree-Law 13/2014, validated by the Cortes Generales on 16 October 2014, and which carries the status of a Law, orders the hibernation of the facilities and the allocation of its administration to the company Enagás Transporte, S.A.U. (belonging to Enagás, S.A.). The company thereby undertakes,



during this hibernation, to carry out its maintenance and the drawing up of technical reports and – if necessary and decided by the government – the work required for its dismantlement.

In accordance with the aforementioned Law, this measure is justified by the exceptional and urgent need to attend to the complex technical situation of the facility, in particular following the renunciation of the concession presented by its previous owner.

This legal text also sets out that the experience acquired by Enagás, in the management and operation of underground storage facilities and as the owner of the main facilities of this type in operation in the gas system, guarantees the effective maintenance of the Castor underground storage facility in secure conditions.

21 March 2016
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