

Assurance and Digitalization of Strategic Information of Oil Assets in The Abandonment Process

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Abstract

Assets in the abandonment process represent one of the greatest challenges for oil operators, because according to their characteristics they include legal, technical, environmental, social, labor and contractual obligations, without representing an economic income derived from the oil or gas production.

This problem has a direct impact on profitability and exposes the company to cost overruns that are difficult to quantify when the operation is suspended, but the obligations remain in force, resulting in penalties and liabilities as a consequence of omissions and erroneous interpretations of environmental and/or contractual instruments, generally associated with inefficiencies in the assurance of information.

The assurance and digitalization of strategic information applied in the management of oil assets in the abandonment process, aims to ensure timely access to information, provide complementary technological tools to all work lines involved and facilitate the monitoring of obligations to the operator, optimizing the cost and time in the attention and fulfillment of these obligations.

Keywords: Assurance and digitalization of strategic information, abandonment assets, obligations management, environmental instrument, optimization of costs and resources in the abandonment stage.

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Introduction & Innovation

One of the most recurrent problems in the assurance of oil information lies in the technological limitations times in which oil assets were developed, recording much of this information in physical folios, that due to natural deterioration were lost. Specifically, in abandonment operations, metal plates are installed where the well name, drilling date information, total production and abandonment date are recorded, among others, and the main challenges faced are theft and deterioration.

The proposed methodology allows securing the information by digitizing the data in a physical format and linking in a cloud system different accesses installed in the fields through chips with NFC (Near-field communication)

technology, which is a wireless communication technology, short range and high frequency, that enables the exchange of data between devices, thus allowing real-time access to information by interested and authorized parties in the field or in the office.

The innovative application lies in the installation of chips with low-cost NFC technologies, coated with nano paints that protect it from natural deterioration, guaranteeing an average useful life of at least 30 years, and which fulfill the function of storing the well and field information among other vital data of the asset. One of the limitations is the number of characters that can be stored; therefore, another innovation factor of this methodology lies in the segmentation and access through remote links to the information, turning the chips into keys, which allows unlimited storage in the cloud. In addition, it is worth mentioning that this methodology not only focuses on infrastructure inventories, but also on subsurface and surface information

Diagnostic and Information Assurance

Determining whether an asset will be definitively abandoned depends strictly on the operator, except in specific cases, when there is a risk to the environment and/or human health derived from the activities developed within the framework of the productive project, or when the concession granted by the State for the area administration expires.

For this reason, the first diagnosis stage consists of the total identification of the contractual, normative, regulatory and legal obligations, with the objective of establishing the degree of compliance and the gaps to be closed under the current conditions, taking into account that the assurance of these obligations does not depend in any case on the economic, technical and/or strategic interests of the operator.

The objective of this first stage is to chronologically organize the obligations according to the deadlines established for their execution, and classify them in hierarchical order according to the level of risk and impact associated with negative deviations in their compliance, without leaving aside that the evaluation must be carried out for each well, homologating obligations that comply with conditions that allow it, as is the case of shared access roads, community benefit programs (PBC), environmental monitoring of shared areas, etc.

It is important to note that in Colombia and especially in historically producing regions, wells may have been drilled in different years and currently to be in different operational stages (temporarily abandoned, producers, injectors, etc.) and therefore, have obligations that vary according to the current regulations for each period, which is why performing this analysis individually is crucial not only to prepare the baseline, but to ensure adequate compliance management, eliminating the risk of over costs due to omission or homologation of commitments.

Industrial and Economic Impact

The abandonment and decommissioning stage of a field is a process that requires a high commitment from the companies, to leave the area in the best social, environmental and operational conditions. Oil and/or gas producing or injector wells, as well as human life, end with the plaque and the monument.

The construction of an abandonment plaque is approximately \$58.40 USD, versus \$5 USD for an installed chip, replacing the plaque and without the risk of theft or deterioration in a short time as the plaque does. NFC technology is generally manufactured for metal surfaces but can be used on all kinds of different surfaces such as plastic, concrete and wood and is used in a variety of applications.

Installing these chips in place of conventional metal plates would represent a saving of 83% per well. Another advantage is that these chips can be replaced as a whole or

individually in case of damage without affecting the stored information and their installation is very simple.

In Colombia, the main beneficiaries of the implementation of this technology are government entities such as the National Hydrocarbons Agency and the National Environmental Licensing Authority, because the protocols and formats in which the information is stored are aligned with the technical manuals of these entities, facilitating their verification and assurance.

Additionally, the digitalization and remote access to the information allows the operating companies to guarantee the correct planning of productive activities, having the certainty that the stored information corresponds to the field and/or well of interest, because the chips are installed directly in the infrastructure with the objective of eliminating the risk of confusion due to nomenclature or geographic location.

This seems to be a simple solution, but it has a great economic and functional impact. These chips are developed and designed by us, based on NFC technology.

Results and Conclusions

The installed chips have a useful life of 25 to 30 years and can be replaced as a whole or individually in case of damage without affecting the stored information.

The main beneficiaries in Colombia of the implementation of this technology are government entities such as the National Hydrocarbons Agency and the National Environmental Licensing Authority, due to the ease of verification and assurance of information, which facilitates their verification and assurance.

The operating companies also benefit from this technology, since, thanks to digitalization, it allows remote access to information and the correct planning of their operations, having the certainty that the information stored corresponds to the reservoir and/or well of interest.

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