

REPEATING A SATELLITE SEISMIC SURVEY EXTENDS THE LIFE OF THE DEPOSIT BY DISCOVERING RESERVOIRS HIDDEN DURING THE FIRST SEISMIC SURVEYS

The combined use of **RSS (Remote Sensing Survey)** and **NMR (Nuclear Magnetic Resonance) technologies** can effectively help to extend the productive life of a well by highlighting reservoirs that had not been identified or properly characterized during the first traditional seismic campaigns.

Here's how this approach provides significant added value for the revitalization of mature fields (Brown Fields):

1. Direct detection vs. indirect interpretation

The main difference lies in the nature of the measures:

- **Traditional seismic (2D/3D):** This is an indirect method that interprets acoustic impedance contrasts. It is effective for defining the overall geological structure, but it can miss areas of low contrast or complex reservoirs.
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- **RSS-NMR:** These technologies use "direct" sounding methods. NMR, for example, interacts directly with the hydrogen nuclei of fluids (hydrocarbons, water) in pores. This makes it possible to identify the presence of fluids independently of the lithology (rock structure), which can sometimes obscure reservoirs during conventional seismic interpretations.
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2. Identification of "forgotten" or neglected reservoirs

The accuracy of NMR (whether used in logging or via spectral remote sensing methods) allows us to distinguish:

- **Mobile fluids from bound fluids:** NMR can differentiate extractable hydrocarbons from those trapped in the rock matrix.
- **Thin or complex layers:** Where seismic can "smooth" the data, NMR offers a resolution capable of revealing pockets of oil or gas in low permeability reservoirs or complex geological structures (e.g., tight sandstones or laminated reservoirs) that had not been initially targeted.

3. Optimization and risk reduction for production

To extend the life of a well, RSS-NMR technology helps to:

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- **Targeting new "sweet points":** By precisely identifying areas saturated with residual or unexploited hydrocarbons, it makes it possible to guide work -over (rehabilitation) or side -track drilling operations towards areas with high potential.
 - **Reducing exploration costs:** By confirming the presence of fluids before launching new costly drilling, it drastically reduces the risk of drilling "dry" or unproductive wells, thus increasing the overall profitability of the field life extension project.
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In summary

If your initial seismic surveys haven't unlocked the full potential of the deposit, integrating RSS-NMR data allows you to **"see" what was invisible** to acoustic methods. It's an approach complementary powerful For :

1. **Accurately map** the saturated areas that have not yet been drained.
2. **Characterize the quality** (porosity, permeability) of these areas to validate their commercial viability.
3. **Decide on targeted technical interventions** to extract these additional reserves and extend the productive lifespan of your existing infrastructure.

Note: Although these technologies are cutting-edge tools, their success still depends on integration with geological data from existing wells to validate reservoir models.

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