

Challenge's Topic

REDUCTION OF LOSSES IN SURFACE ELECTRICAL EQUIPMENT (VSDs AND TRANSFORMERS) FOR CONTROL AND PROTECTION OF THE ELE CTROS-SUBMERSIBLE PUMPING SYSTEM OF THE A AND H BLOCKS

Introduction

In an electrical installation there are energy losses inherent to the process of equipment operation, these are:

- Fixed losses: Due to the physical characteristics of the electrical components.
- Variable losses: They are given as a function of the magnitude of current flowing through electrical equipment.

These losses are dissipated as heat in elements of final consumption, which in this case are engines of the ESP equipment, increasing its operating temperature and consequently reducing its life.

With the project of losses reduction in surface electrical equipment (VSDs and transformers), it is expected to reduce losses in electrical equipment that intervene in oil extraction process, shorten the energy consumption of production wells and therefore the generation of heat in the induction motors of ESP equipment, which would increase the operating hours of these elements.

The reduction electrical charge that the wells represent, would reduce operating costs of A and H Blocks.

As a consequence of the reduction of the electrical charge, energy losses in its transmission would also be reduced, which in turn has an economic impact on the operation.

* VSD: Variable Speed Drive.

* ESP: Electro submersible pump.

Scopes/objectives

1. Creating an analysis for reducing losses in the electric surface equipment (VSDs and transformers) for control and protection of the electro submergible pumping in the A and H blocks.
2. Determining the elements or operating parameters on which can be executed a certain action, which allows optimizing the use of energy focused on increasing useful life of the ESP equipment.

Careers involved

1. Electrical, Electronic, Electromechanical Engineering or related.
2. Petroleum Engineering.
3. Mathematical Engineering.
4. Chemical Engineering (Processes).

Additional Information

A specific software is not required. In the case of generating a mathematical model, programs such as Matlab or Python can be used.

In the case of requiring the modeling of the electrical system, the use of ETAP software is recommended.