



CASE STORY

Reliable Power Quality in Offshore Drilling with Comsys ADF P300 Active Harmonic Filters

» LOCATION

Dubai, UAE

» INDUSTRY

Marine / Offshore Drilling

» LOCAL PARTNER

Gulf-Tech Automation

» INSTALLATION DATE

2025

BACKGROUND

Gulf-Tech Automation, a trusted Comsys partner based in Dubai, was contacted by a leading offshore oil platform operator in the UAE. The operator planned to increase production capacity by adding a second Electric Submersible Pump (ESP). The existing pump, referred to as RA-18 ESP, already ran alongside the platform's base electrical load. The new addition, RA-01 ESP, would raise the total operating load to approximately 480 kW.

With the expansion came a clear priority: uncompromised voltage quality and uninterrupted operation, with no room for failures or downtime. Hence, THDv was given high priority. Whether the distortion came from the load or the background, the customer required THDv to remain within 5% to protect the loads and maintain reliable operation.

CHALLENGE

With a second ESP pump on the way, the operator needed to ensure that THDv remained below 5% under all load conditions. While no immediate issues like overheating or equipment failure had occurred, the risk of long-term damage or instability was real.

A solution was needed that could:

- Keep the power system compliant with harmonic distortion limits
- Prevent future power quality issues as loads increased
- Integrate into an offshore environment with high reliability

SOLUTION

To address the expected rise in harmonic distortion, Gulf-Tech Automation proposed the installation of two Comsys ADF P300 active harmonic filters operating in parallel. These air-cooled, sensorless filters (without any CT's) were chosen for their ability to respond in real time to changing load conditions and keep voltage distortion under control—even in harsh offshore environments.

In sensorless control, ADFs operate completely without CTs, addressing the vector of both load and background distortion while keeping THDv on the bus at target levels—no matter where the distortion originates.

Before moving forward, the operator tested one ADF unit on-site. During the trial, voltage distortion levels dropped noticeably, confirming that the filters could handle the load increase without pushing THDv over the limit. That trial gave the team the confidence they needed to proceed.

Installation and commissioning were completed in May 2025, with close collaboration between Gulf-Tech and Comsys ensuring everything was up and running smoothly.

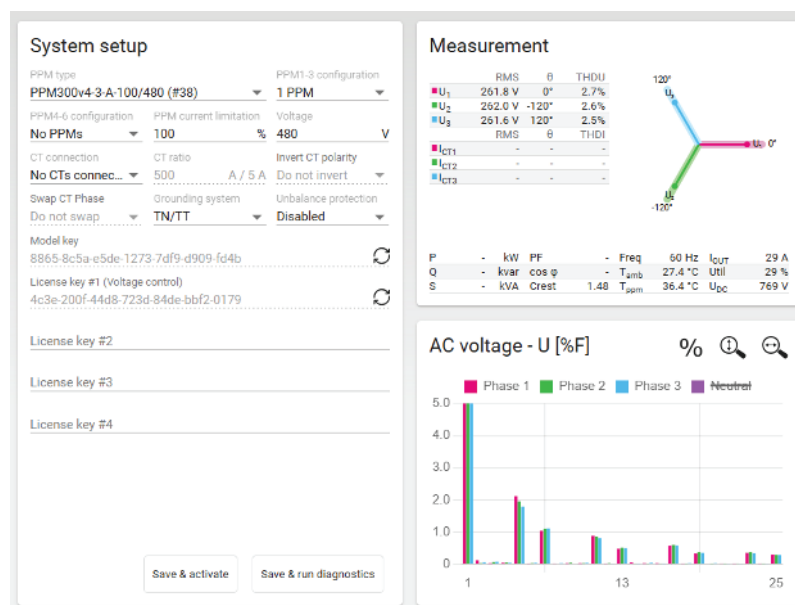


RESULTS

The improvement was immediate and measurable:

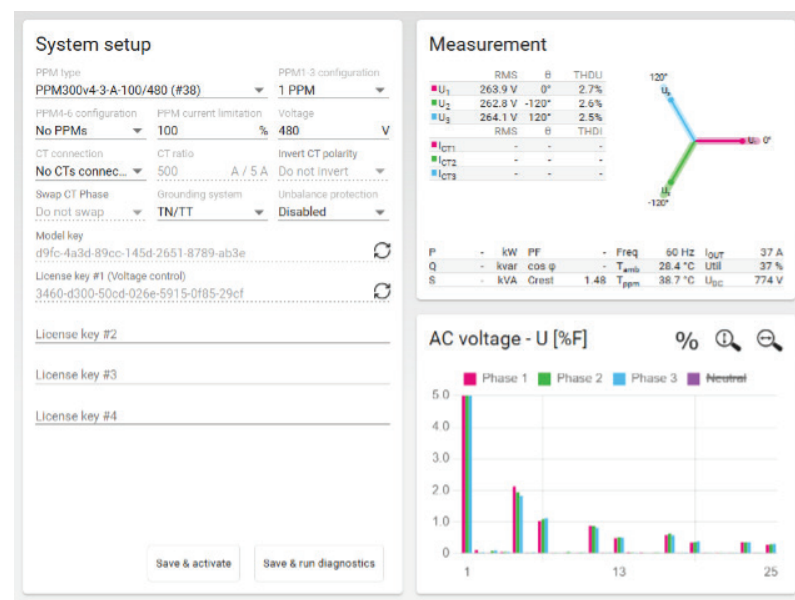
System Configuration	THDv	Total Load
RA-18 ESP + Platform Load	2.7%	392 kW
RA-18 + RA-01 ESP + Platform Load (Full Load)	3.6%	480 kW

Even at full capacity, THDv remained well below the 5% limit, protecting equipment and ensuring compliance with international standards.



Measurements with ADF ON

CUSTOMER FEEDBACK



Sensorless control was a new concept for the customer, and the installation and commissioning process was so straightforward that it proved a perfect fit for the application. The offshore operator was highly satisfied with the results. In fact, following the successful commissioning, they placed additional orders for more ADF units to support other systems on the platform.



PRODUCT USED IN THIS CASE

ADF P300

- » HARMONIC ELIMINATION
- » LOAD BALANCING
- » DYNAMIC VAR COMPENSATION
- » MODULAR & SCALABLE DESIGN
- » FLICKER COMPENSATION
- » 208-690V NOMINAL VOLTAGE
- » CLOSED LOOP, OPEN LOOP & SENSORLESS CONTROL