

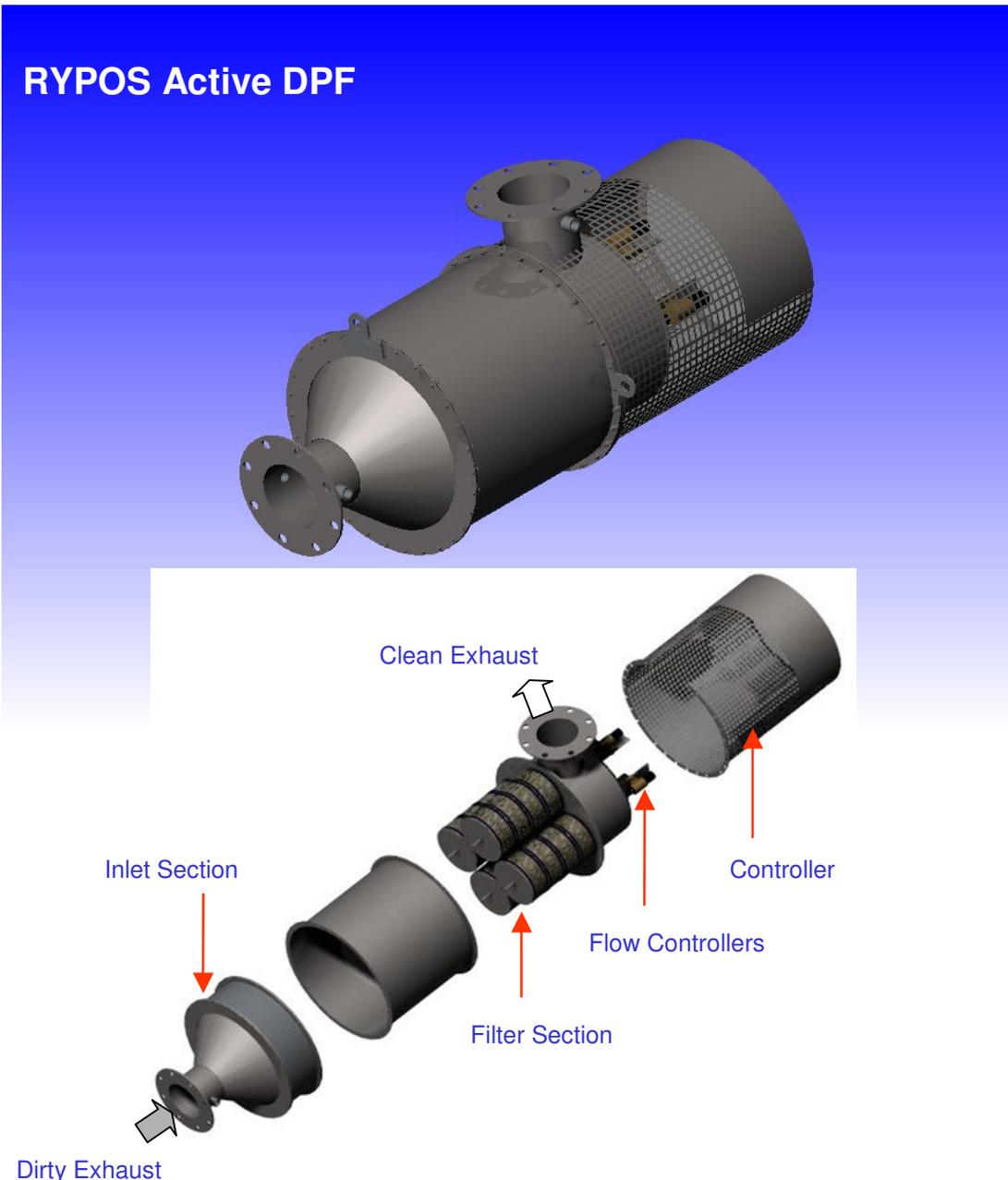
RYPOS Active Regeneration Technology: Durability Testing

Frank DePetrillo, Amin Saeid, Zack Nardi and Peter Willey

Objectives

Rypos is currently engaged in long-term durability testing of its actively regenerated diesel exhaust particulate trap. The current series of tests are being conducted in accordance with the verification guidelines proposed by CARB and EPA for emergency diesel powered electrical generators and diesel pumps. The tests show the ability to operate the trap under a variety of conditions, including extended idling, while maintaining backpressure within limits. The regeneration is independent of exhaust temperature, and the system does not require low sulfur diesel fuel.

RYPOS Active DPF



Test Procedure

These tests are conducted in accordance with the verification guidelines proposed by CARB for emergency generators and pumps. The CARB durability testing cycle is one part of the larger verification process for approved emission reduction devices. These tests include cold starts, hot starts, low, medium, and high loads, and pump simulations. The test bed is a 225 kW stand-by diesel generator set, manufactured by Caterpillar Corporation, and an adjustable 250kW load bank manufactured by Avtron Inc.



Results

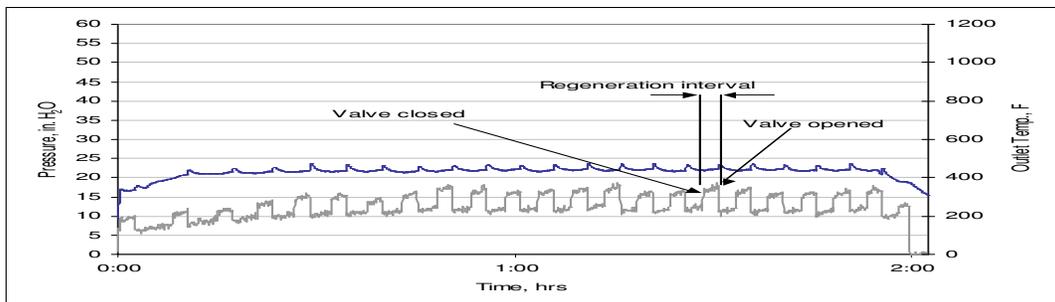


Figure 1: Low Load Run (23 kW)

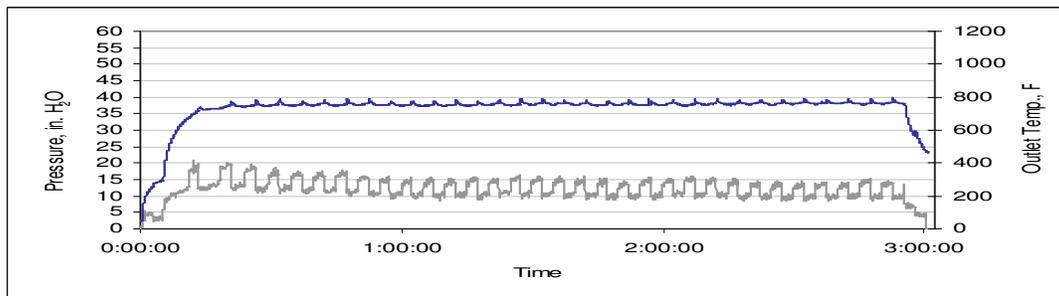


Figure 2: Mid Load (113 kW)

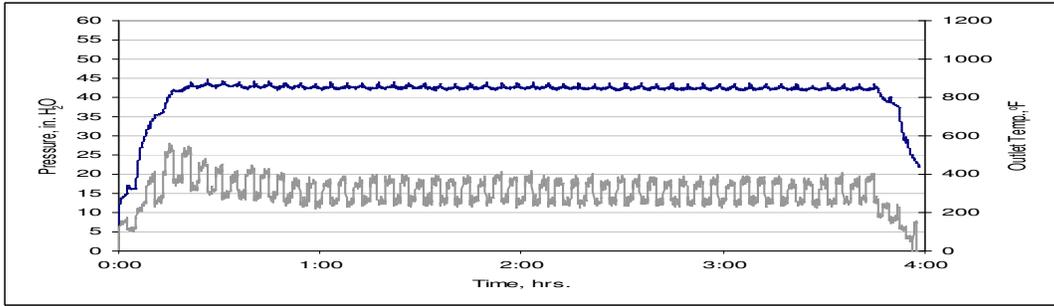


Figure 3: High Load (168 kW)

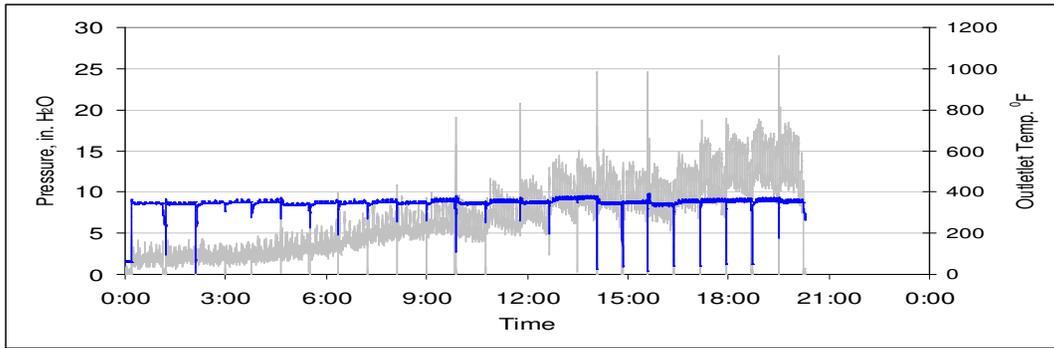


Figure 4: 24 Consecutive Cold Starts

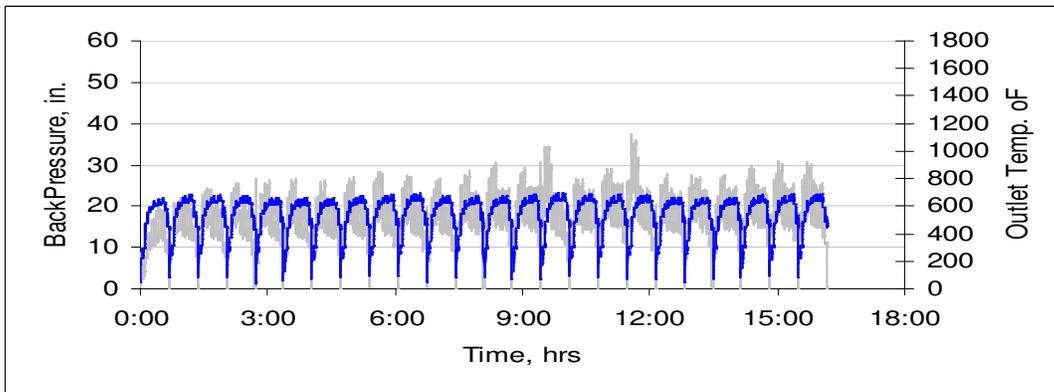


Figure 5: 24 Consecutive Pump Simulation Cycles

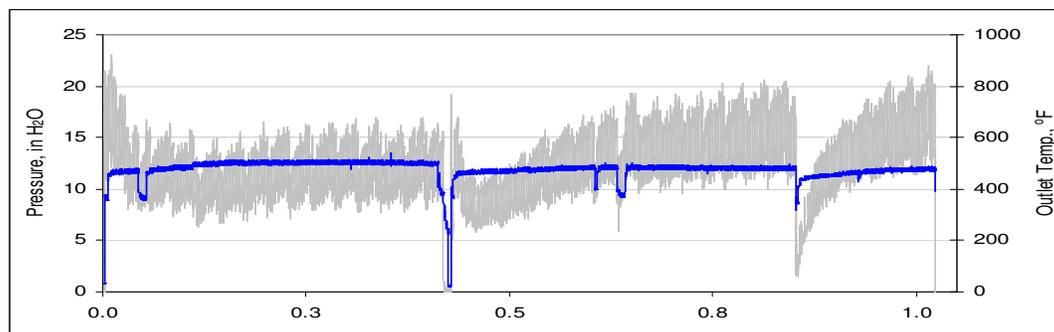


Figure 6: 24 hours of Low Load (23 kW)

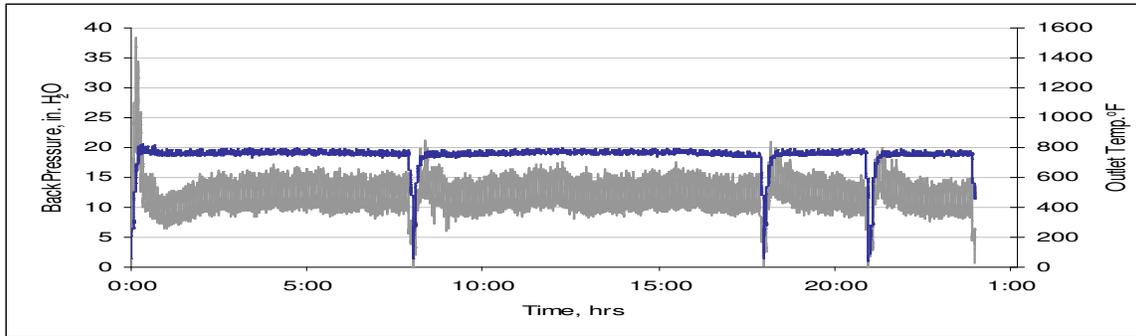


Figure 7: 24 hours of Mid-Load (113 kW)

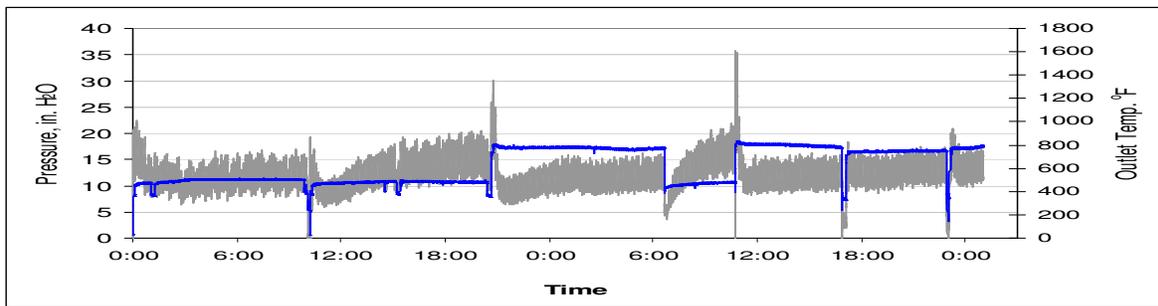


Figure 8: 48 hours Combined Low and Mid Load runs

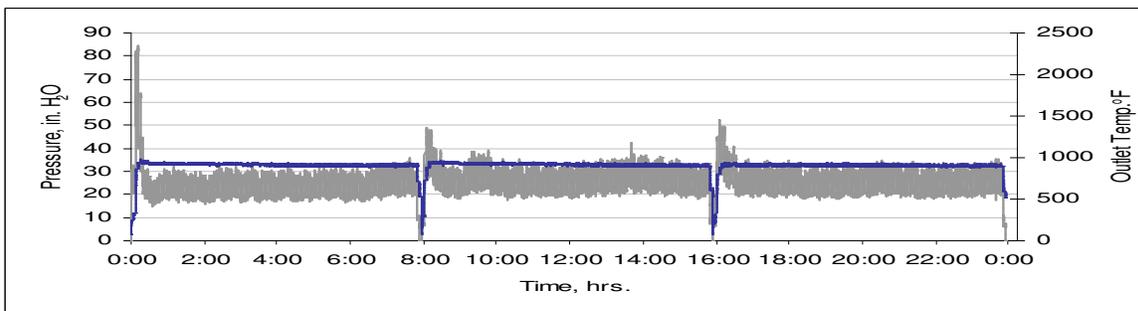


Figure 9: 24 hours of High Load (168 kW)

Conclusions

- Regeneration independent of exhaust temperature and load cycle.
- High sulfur content fuel has no effect on performance nor durability.
- Filtration performance consistent for the duration of the test.
- Consistency in maintaining low engine backpressure.
- Low energy consumption.