



## Fakel Burner Inspection

*CONDOR Solutions carried out new inspection of the fakel burner in the facility of Lunscoe OPF in October 2016. The facility is owned by Sakhalin Energy whose major shareholders are the companies Shell and Gazprom. The facility of OPF is located in the Northeast coast of Sakhalin island in the Russian territory. It is located 7km in the inland region, at the place of influx of the gas-pipeline from the platform Lunscoe A. The entire facility takes the area of more than 62,000 m<sup>2</sup>.*

### Fakel Burner



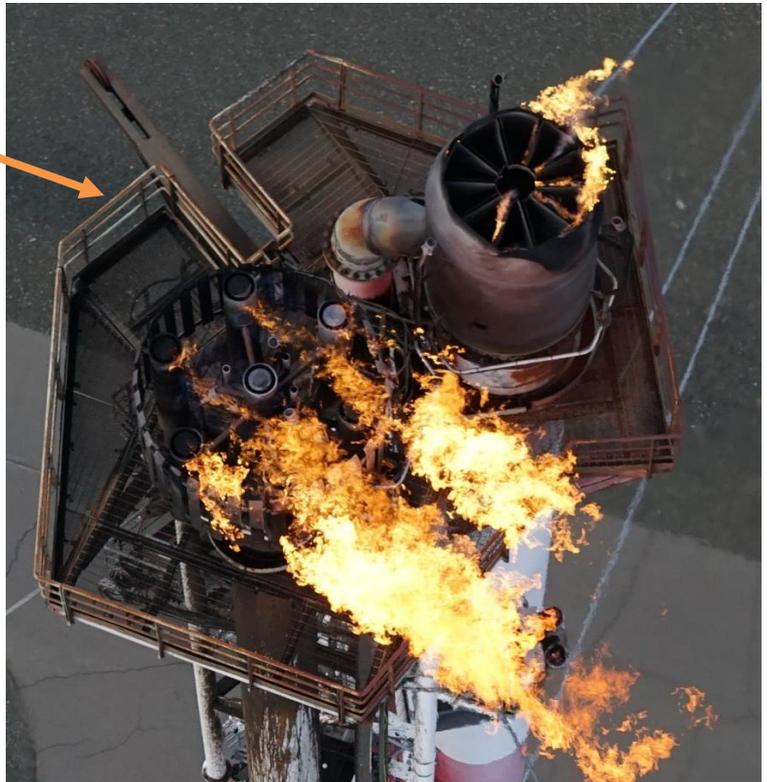
*Thermal imaging camera Workswell WIRIS mounted on a drone*

The primary function of OPF is aimed to processing of gas and condensate from the site of Lunscoe, as well as preparing them for transport by the pipeline to the export crude oil terminal and production plant of compressed gas LNG - Prigorodnoe Complex. It also receives gas and crude oil from the platform Piltun-Astochskovo-A and the platform Piltun-Astochskovo-B, while preparing them for transport to the export terminal in the south of the island. There are pumps which allow processing up to 195,000 barrels a day. At full capacity, this facility can handle 51 million m<sup>3</sup> of gas/ day and 9,500 m<sup>3</sup> of condensate or crude oil / day. All technological systems at the OPF were commissioned in 2008.

An important part of the facility is also a system of burners, e.g. the burners (Flare System) of low and high pressure. They were also subject to inspection carried out by the company CONDOR Solutions. The weather during inspection was cloudy, with the wind of 14 m/sec and the temperature of -10°C.



*General view on Flare Stacks and Flare Tips.  
View from south.*



*Detailed view of Flare Tips. View from south.*

## Why inspection is important

The primary task was to conduct visual inspection using a UAV technology. However, in addition to the standard camera SONY Alpha 7R, we were newly using the thermal camera of Workswell, e.g. the thermal imaging camera Workswell WIRIS.

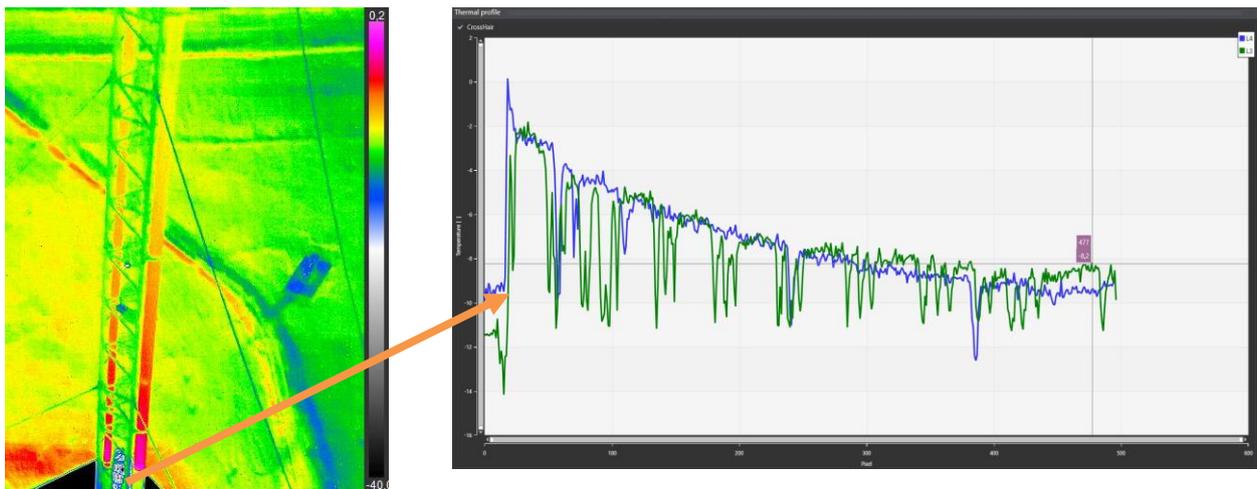
The operational technologies are exposed to extreme weather conditions due to the geographical location. Most of the burners is exposed to very low and freezing temperatures (-) and also to extreme positive temperatures (+) caused by gas combustion. Therefore, it is important to check out the system of burners completely, using thermal imaging camera.



*Thermal imaging camera Workswell WIRIS  
2nd gen with high temperature filter.*

## Inspection with Workswell WIRIS

Thermal imaging camera Workswell WIRIS allowed us to measure the temperature of the entire system of the burner. Doing the measurements, we have found that the burner system includes both low and very high temperatures. Therefore, we divided the measurements into two parts, as follows: - burner's mast from the bottom part up to the top service runway. - upper part of the burner's shank. This thermal imaging camera offers possibility of measuring the temperatures up to 1,500°C, using a high temperature filter, as the only one of the systems available for the drones.



*Thermal profile measured on the surface of burner system. Software Workswell CorePlayer was used for thermogram analysis.*

In the first part, we found out the temperature of the mast and the rising pipeline of the system of high and low pressure; we also prepared the temperature profile, as shown in the figure. The graph and thermogram clearly show where the pipeline isolation finishes. At this point, the temperature sharply increases up; and consequently the temperature gradually decreases together with the height, up to the upper part - the shank; then the temperature rapidly increases up again. Up to the temperature of about 2,000°C.

## Conclusion

Based on information obtained by the thermal imaging camera of Workswell WIRIS and the unmanned aerial vehicle, the company CONDOR Solutions compiled the final report which described in detail the condition of the burner system of high and low pressure. The operator, e.g. Sakhalin Energy, has got the data on the basis of which it is possible to schedule maintenance works so that restriction of the production process in the facility is minimized as much as possible.

[www.thedroneinspection.com](http://www.thedroneinspection.com)

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