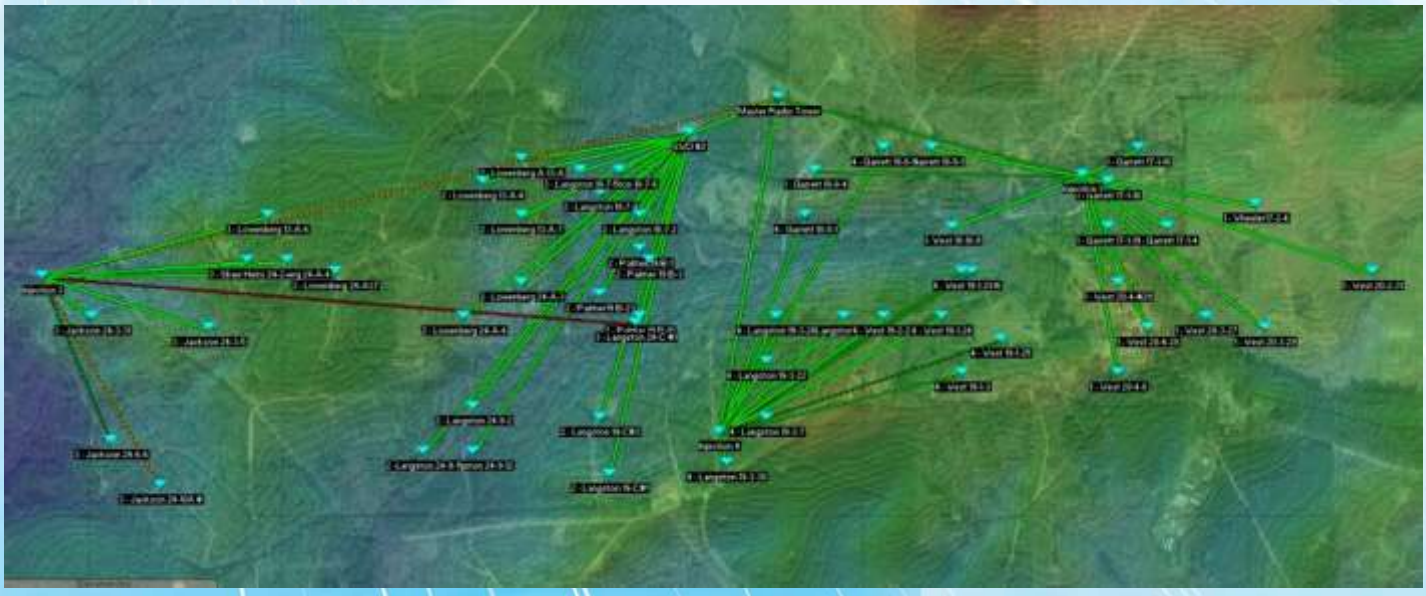
Gulf Coast TMC was faced with a task of automating a 100-year-old oil field. This field, located near Homer LA, has been producing oil since approximately 1918. This field uses a water flood system to pull oil from the earth and has been using this method for decades. Extracted fluid is pumped out of the ground. The oil and water are separated at a tank battery, the oil is sent to tanks to be hauled later and the water is re-injected into the ground. The water is used over and over to extract the oil as it seeps back into the reservoir. The field is divided into four sections, including four tank batteries, where the oil is collected, and four water injection stations where the water is injected back into the ground.

The goal of this project was to automate the entire field so that if there was a high tank alarm in a certain section, all wells feeding that section would shut in remotely. Currently, in an alarm condition, the operator would have to drive to each location and manually shut down the pump. The operators also wanted an emergency shut down button at each of the central stations, so that if there is an issue on site, they have the ability to shut an entire section down with the push of a button. Each wellsite has a J-box that was installed with an ELPRO 415U-2 I/O radio, a permissive relay from the tank battery that it was feeding and a permissive relay from the injection station that it was feeding. These permissive relays are related to the communication status from the battery/injection stations, an AC power status from the battery/injection stations, and a high tank alarm status. If any of these three statuses were not clear from both stations, all wells in that section will shut in remotely. The wells are not able to start flowing again, and the motor starters are not able to turn on at each location until the alarms are cleared by the operator from the tank battery/injection stations using a reset button.



The terrain in this area is hilly and dense with trees so it was decided that the best frequency for this application was 450 Mhz. The field stretches only a few miles, but most locations are not easily accessible by a vehicle. All locations including the tank battery/injection stations talk back to the master radio at the main office, where there is a 70ft master radio tower. The operators have a touchscreen in their office that gives them live statuses along with a system set up where they can see live statuses from their phones as well. With the help of ELPRO, this automation project has been a remarkable success, and a win, win for all parties involved. This producer no longer needs to worry about the constant threat to shutting in their field because of spillage fines, and the operators can sleep a lot better at night knowing that that if a high tank alarm goes off, they do not have to rush to the field and start the race to shutting in wells before the tanks begin to overflow.

The ELPRO radios provided easily configurable I/O, and network assignment. Another benefit to using ELPRO was the availability to use the 450 MHz system. Considering the geography of the area, 900 MHz would not have been able to get the job done. Also, there was no need for an RTU on the location, so the I/O radios were a perfect fit for the job allowing user-friendly programming and configuration. The

way that the entire network works together, and how each radio can talk to one other was the biggest benefit to using ELPRO for this application. All the radios in the network work together as one system. For example, whenever the central battery and water injection station for section 1 have a good status for comms back to the master, a good status on AC power, and a good status on tank levels, the radios at these central stations communicate their status to the corresponding wells in that section. In return, the individual locations that are feeding section 1 get their permissive to run the motor starter and begin flowing. As soon as any of these statuses change at the central locations, the signal that allows the motor starter to run is disabled and the well shuts in, which was the goal of this project.

Attached below are pictures of the j-boxes located at the central battery/injection stations and the j-boxes located at each individual location. Also below is a picture of the overall view of the field.

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