Plaquemines LNG Megaproject in Port Sulphur

Challenge:

Venture Global, Inc. set off the construction of the Plaquemines LNG terminal, making the plant one of the largest LNG facilities globally with an export capacity estimated to be 20 million tonnes per annum (MTPA). The massive project would require the installation and testing of thousands of piles to support the plant infrastructure. GRL Engineers provided SLT, PDA, APPLE and PIT testing services. The results from the PIT testing pushed the project in the direction of expanding the pile program with SLT and APPLE to evaluate potential shaft defects.

Method:

Many of the installed piles for the LNG facility underwent a pile integrity assessment by use of Pile Integrity Testing (PIT) also known as low strain integrity testing. Following testing, several piles indicated unplanned tensile reflections and impedance reductions before reaching the pile toe. The tests identified an indication of a probable defect corresponding to a reduction in size or material quality. Due to these impedance changes, SLT and APPLE testing were implemented to further assess pile integrity and capacity.

The piles were tested with GRL's APPLE drop weight system. This load test device had an 8-ton ram weight and variable drop height. Drop heights used during testing ranged from 0.5 to 4.0 feet. 3.0 inches of new plywood was placed on top of the load cell as cushioning for the impact along with a ¼ inch sheet of plywood between the pile top and load cell. APPLE testing was implemented on 200+ piles.

In addition to APPLE testing, a SLT program was performed to evaluate the performance of suspect piles. These results were then used to correlate dynamic testing to static testing.

Results:

The results from the two methods, static load testing and dynamic load testing revealed a positive correlation. This correlation indicated a procedure for analysis with the CAPWAP model that best matches the results of the SLT. Overall, there was a positive correlation between the use of a compression slack model in the CAPWAP that is the best indication of pile integrity and mobilized capacity.

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Project Details

Client: KZJV & Cajun Industries

Location: Port Sulphur, LA

GRL Office: Louisiana

GRL Services

- Static Load Testing (SLT)
- APPLE Testing
- Pile Driving Analysis (PDA) Testing
- Low Strain Integrity (PIT) Testing