

Well Testing Case History

Safety Measures Reduce Risk on HPHT

Challenge

On a small location canal in the marshes of Southern Louisiana, an operator drilled an HPHT high rate gas well. In order to ensure completion integrity and reservoir properties, the operator set a test objective of 50 MMscf/d and contacted CETCO Energy Services to make all necessary arrangements for a well test operation. After performing a site visit, it was clear, given the nearby production facility, drilling rig, recreational camps, and vegetation, that the potential for fire and loss of property was initially deemed high risk.



CETCO Solution

After a heat radiation study, extensive site survey, and assessment of readily available flaring systems, the risk was drastically decreased through CETCO engineering controls. These controls included a vertical 60' flare stack, high pressure flare scrubber, extensive deluge system, clearing of vegetation, selection of barge with high free board, and weather restrictions to mitigate risk in an environmentally sensitive area.

Three 180 ft. barges were contracted with a freeboard of 13 ft. One of the three barges was equipped with spuds to hold the barges in place during operation. A 60 ft. 10" vertical flare stack was mounted on the flare barge. Surrounding the flare stack were four high volume water cannons used to wet surrounding vegetation. This configuration positioned the flare stack over 400' from the production facility, which was deemed an acceptable distance by the operator. Several 6" stainless steel hoses were used as flex joint between the barges for a high pressure gas flare line. The vegetation was

removed 20' into the marsh from the bank to reduce the likelihood of spontaneous combustion. A standby boat was equipped with water cannon to aid as mobile firefighting unit and a flare scrubber was used between the flare stack and the separator to reduce the risk of carry-over and fall-out. Level safety high (LSH) were in service on both vessels to prevent carry over.

60' Stack with 30' High Trees

Release Rate of NG MMSCFD	Distance from stack ft	Radiation @ grade With 60' stack Btu/hr/ft ²	Radiation @ tree top (30' high) Btu/hr/ft ²
10	10	409	869
	20	511	1210
	30	655	1798
	40	537	1308
	50	428	929
20	10	596	1111
	20	718	1440
	30	883	1941
	40	906	2016
	50	735	1488
30	10	734	1279
	20	869	1603
	30	1044	2067
	40	1154	2382
	50	951	1815
40	10	846	1410
	20	989	1729
	30	1172	2170
	40	1337	2604
	50	1116	2032
50	10	941	1517
	20	1089	1832
	30	1277	2256
	40	1481	2754
	50	1249	2191

Outcome

At no point was the operation delayed or restricted due to flaring. CETCO was able to meet test objectives and delivery through experienced project management, technical equipment selection, and vigilant personnel.

