



Project:	Yanbu Al-Muajjiz Terminal	Contractor:	Gulf Steel Works	End User:	Saudi Aramco
Product:	Bi-Directional Meter Prover	Location:	Saudi Arabia	Year:	2014

### Application

This was the first contract that OGS received following our approval by Saudi Aramco for the design and fabrication of various types of Custody Transfer Metering systems. The Prover was to replace the existing bi-directional prover at the Al-Mu'ajjiz Terminal which was first installed in the late 1980's. It is the largest Prover of its kind in Saudi Arabia. Other parts of the Custody Metering System, such as the Metering Control System, were replaced or upgraded via separate contracts placed on others.

### Description

The skid mounted Prover was fabricated, assembled and calibrated in our Gorseinon facility and the overall size was 22m long x 6.6m wide and 10m high, weighing 48.5t.

It comprised of a 42" diameter meter prover with 48" launch and receive chambers in 150# Carbon Steel. This is the largest Prover that can be used, as defined by the size and flowrate of the 4-Way Valve. The scope of supply also included the supply of this 24" 4-way valve with an electrohydraulic actuator supported by a Hydraulic Pressure Unit; a 16" hydraulically operated Control Valve for flow balancing, and associated instrumentation all cabled to skid edge Junction Boxes.

Due to the height of the launch and receive chambers there was a requirement for high level access and therefore platforms.

To enable the Waterdraw calibration OGS had to produce a number of 'calibration cans' for use by the accredited third party inspectors (SGS). These cans were then provided to Gulf Steel Works (GSW) as part of the overall scope of supply.

After successful testing and calibration the prover had to be split in to transportable sizes and was shipped out to Gulf Steel Works. Upon receipt GSW re-assembled the complete unit, along with the rest of the metering system and ran flow testing using the modified metering control system.

### Challenges

Being the first contract supplied to Saudi Aramco since becoming an approved vendor, particular attention was given by Aramco to the production and testing, with numerous attendees from Client, End User, End User's Inspection Dept. and 3rd Party Inspectorate at the calibration, the coordination of which proved logistically challenging.

A considerable amount of effort was provided by OGS in supporting the client on aspects of the project with which they were not familiar or experienced.

The original contract did not include the full assembly of the Prover nor a Waterdraw calibration, the intention being to send the 4-Way valve directly from the manufacturers in the USA out to Saudi Arabia, however, after the award of the PO, OGS were requested to carry out all of these within our workshops.

Due to the size of the fully assembled Prover, OGS had to make modifications to the workshop roof to allow the installation of the 42" Sphere.

OGS also had to provide additional calibration cans and employ an accredited third party to calibrate the prover volumes.

