

Business Opportunities
in the Oil and Gas Industry

In-Country Value

5 June 2014, Sultanate of Oman



الفرص الاستثمارية في
قطاع النفط والغاز

القيمة المحلية المضافة

5 يونيو 2014، سلطنة عمان



Manufacture shale shaker screens

June 5th, 2014

Presented by:



PDO



Meeting agenda



1. Purpose of this workshop
2. Context and background
3. Scope of the opportunity
4. Industry Data
5. ICV creation through the opportunity
6. Specifications
7. Q&A session



Purpose of this workshop

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- To share the scope of one of the priority opportunities with the business community
- To register interest of the business community
- To set an initial dialogue between the oil and gas industry and business community
- To exchange ICV development best practices
- This workshop is NOT an contractual commitment with any business entity

Next steps

- Business community to register interest by reaching the presenter or the PMO
- Oil and gas industry to reach registered parties for follow-up dialogue and implementation

More information on the ICV blueprint or on other opportunities could be found in the brochure and catalogue distributed today or by visiting www.incountrypvalueoman.net

Context and Background

- Shale Shaker Screens are a consumable that is fitted in the shale shakers on Rigs and Hoists to separate the drilling fluid (mud) from debris (cuttings). Different size screens are needed for different hole size. They are replaced regularly based on Mud Engineer's judgment once damaged due to wear and tear making separation inefficient.
- There are approximately 80 rigs and hoists in Oman each fitted with 2/3 shale shakers each. They generally use Brandt, SWACO or Derrick OEM screens. This scope may be diverted to a local manufacturer manufacturing screens of correct specification.
- There is also a regional market to grow into once the manufacturer is cost competitive.



Scope of the opportunity



Category: Drilling Services

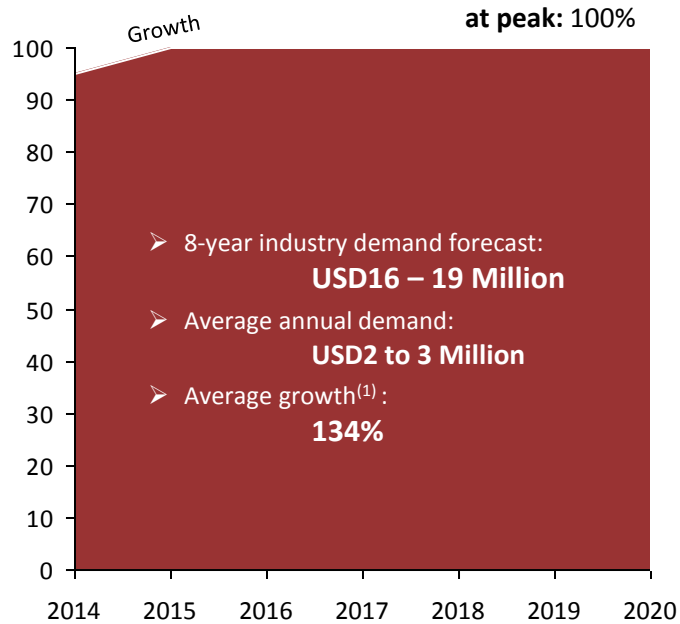
Opportunity

Manufacture shale shaker screens

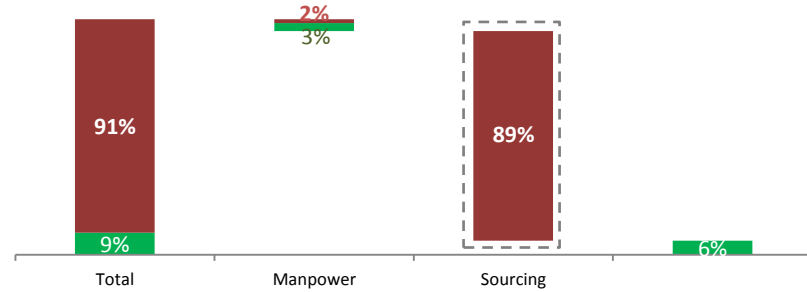
- Rigs and hoists in Oman has rigs and hoists uses an estimated 15 to 20 thousand screens every year.
- Manufacturing involves making the mesh, compressing the composite and QA/QC. Thus this will include job types to address the entire supply chain from procurement, value-addition and marketing. Specialty job areas include operations management, technicians, QA/QC Lab Staff and finally RnD.

Industry demand data

Oil and gas industry 8-year demand forecast



ICV analysis – Local Suppliers



(1) CAGR: compound annual growth rate



ICV creation through the opportunity

We are expecting that this opportunity would increase ICV by:

Potential job creation related to the opportunity

48 – 54 Jobs

Potential ICV related to the opportunity*

4 – 6M

Feasibility of implementation

High

Impact

- Manufacturing shale share screens would increase the demand for steel , which increase the feasibility of further steel mill development
- The impact from manufacturing shale shaker screens will be larger when considering the demand for these screens in the mining industry

Feasibility

- Manufacturing shale shakers requires low technology in the production process. They are made from a screen frame, the screen mesh (metal wire thread woven together) and the binding agent. Although, these screens are relatively simple to manufacture, they pose a risk since poorly manufactured screens can lead to loss of expensive drilling fluids, premature pump failures, and serious problems in the well bore among others

Specifications

API RP 13C (ISO 13501): API RP 13C is a new physical testing and labeling procedure for shaker screens. To be API RP 13C compliant, a screen must be tested and labeled in accordance with the new recommended practice. The tests describe a screen without predicting its performance and can be performed anywhere in the world. Internationally, API RP 13C will become ISO 13501.

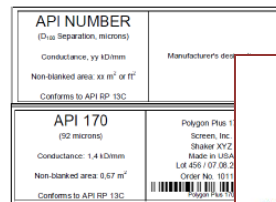


Figure 6 Horizontal format and label exam

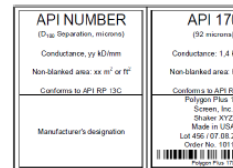


Figure 7 Vertical format and label exam

Putting the Label to Use

Because screens that conform to API RP 13C have all been tested, labels are very helpful when it comes to comparing different screens. It has been determined that there is a need for the cut point provided by a labeled API 170 can be selected regardless of the manufacturer being equal the screen with the higher conductance number should

Alternatively, if there is excess shaker capacity but longer screen with larger diameter wires and perhaps more bonding material should be used. Using screens conforming to API RP 13C can help the operator can

Conclusion

By specifying screens that conform to API RP 13C, much of the process of screen selection/comparison is simplified.

Screen Conductance: Conductance, measured in kilodarcies per millimeter (kD/mm), defines a Newtonian fluid's ability to flow through a unit area of screen in a laminar flow regime under prescribed test conditions. All other factors being equal the screen with the higher conductance number should process more flow.

Non-Blanked Area: The non-blanked area of a screen describes the net unblocked area in square feet (ft²) or square meters (m²) available to permit the passage of fluid.

Background

The use of the term "mesh" (when considering the capabilities of shaker screens) was made obsolete by the introduction of oblong mesh and multi-layer screens which resulted in variations in "aperture sizes". The following photomicrographs (enlarged 60x) show four different screens from four different manufacturers.

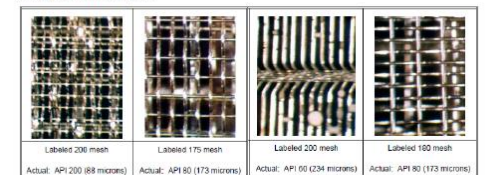


Figure 1 Illustration of the potential confusion caused by "non-standard" screen nomenclature (images courtesy of Derrick Equipment Company)

Rig-based personnel continued to rely on the 'mesh number' indicated by the manufacturer. This may have borne little relationship to the actual separation potential of the screen being used. Hence, comparison of screens from different manufacturers (or even across one manufacturer's series) could be difficult or inaccurate.

In December 2004, the API SC13 voted to accept API RP 13C entitled *Recommended Practice on Drilling Fluids Processing Systems Evaluation*. The practice combined and updated two previous separate documents API RP 13C and API RP 13E. This document was also passed by International Standards Organization as ISO 13501.

API RP 13C covers a number of subjects relating to fluids treatment systems. However this tutorial only addresses screen testing (cut point and conductance), classification and labeling.

Please make use of the additional related information that is available with the four entities



Four booths outside of the workshop rooms:

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الهيئة العامة لتنمية المؤسسات الصغيرة والمتوسطة
Public Authority for SME Development

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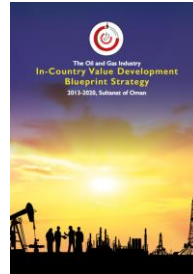


Materials and follow-up

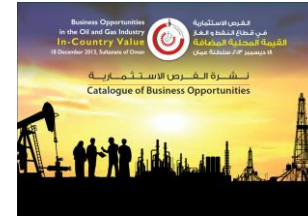
For more information:



Website



Brochure



Catalogue of opportunities

For follow-up:

Register interest by contacting the PMO on: www.incountryvalueoman.net

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Thank you for your contribution!

Our mission:

***Developing a competitive and sustainable local supply
market... Together!***