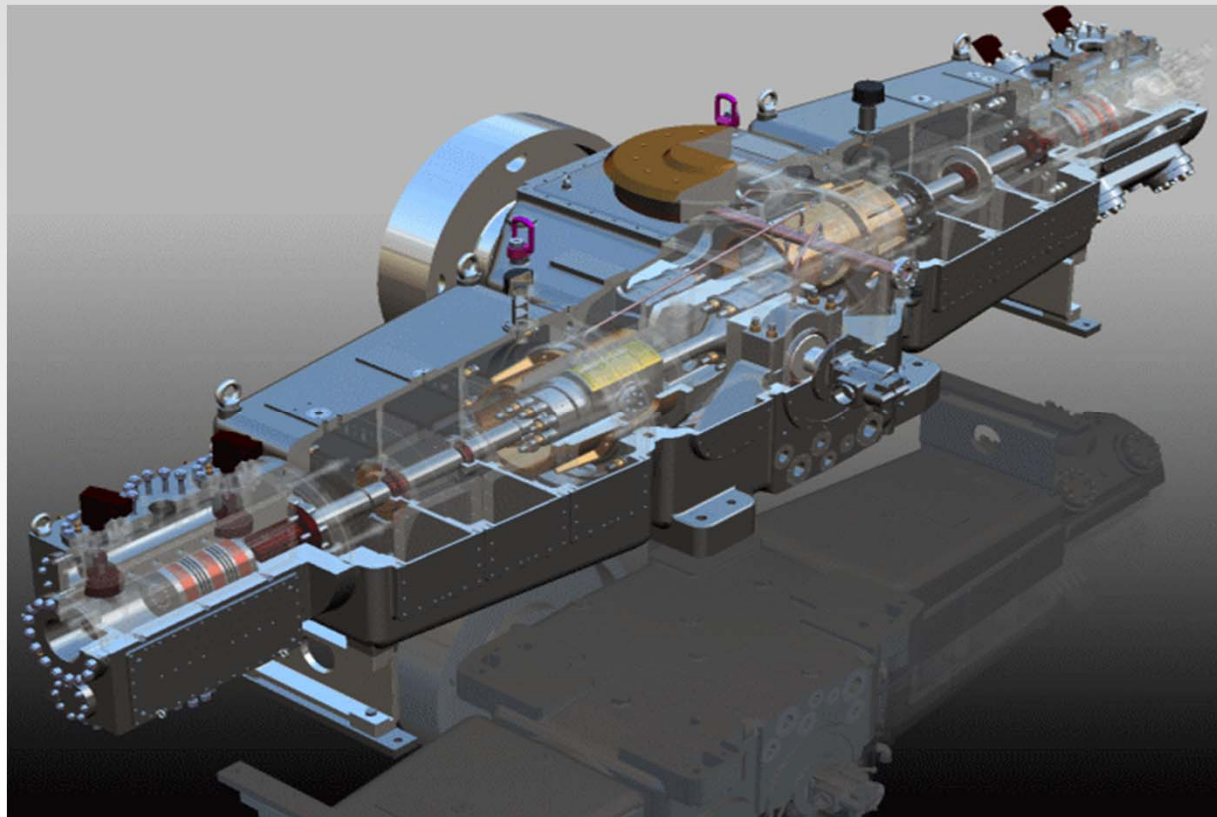


NEUMAN & ESSER USA, INC.



Large Horsepower Variable Speed Reciprocating Compressors



**2012 Gas/Electric
Partnership Conference**

Robert Crow

February 9, 2012

NEUMAN & ESSER USA, INC.

Gas Compression Equipment

- **Pipeline / Transmission**
- **Natural Gas Storage**
- **Natural Gas Processing**
- **CO₂ / Enhanced Oil Recovery**



NEUMAN & ESSER USA, INC.



Follow-up from 2011 – GEP

Rotary Screw - Reciprocating Compressor Package

Three (3) 3550 HP Packages being delivered this week for CO2 Client



NEUMAN & ESSER USA, INC.



Follow-up from 2011 – GEP
Breaking Ground – Tioga Gas Plant Expansion
Extracting Valuable NGLs from Bakken Shale Gas



NEUMAN & ESSER USA, INC.



Large Horsepower Variable Speed Reciprocating Compressors

- High Speed – 600-1200 RPM
- Medium Speed – 450-750 RPM
- Slow Speed – 300-600 RPM



- ❑ 320hs – High Speed – 1750 HP / Throw
- ❑ 320 – Medium Speed – 2850 BHP / Throw
- ❑ 500 – Slow Speed – 5000 BHP / Throw

NEUMAN & ESSER USA, INC.

High Speed Compressors 600-1200 RPM



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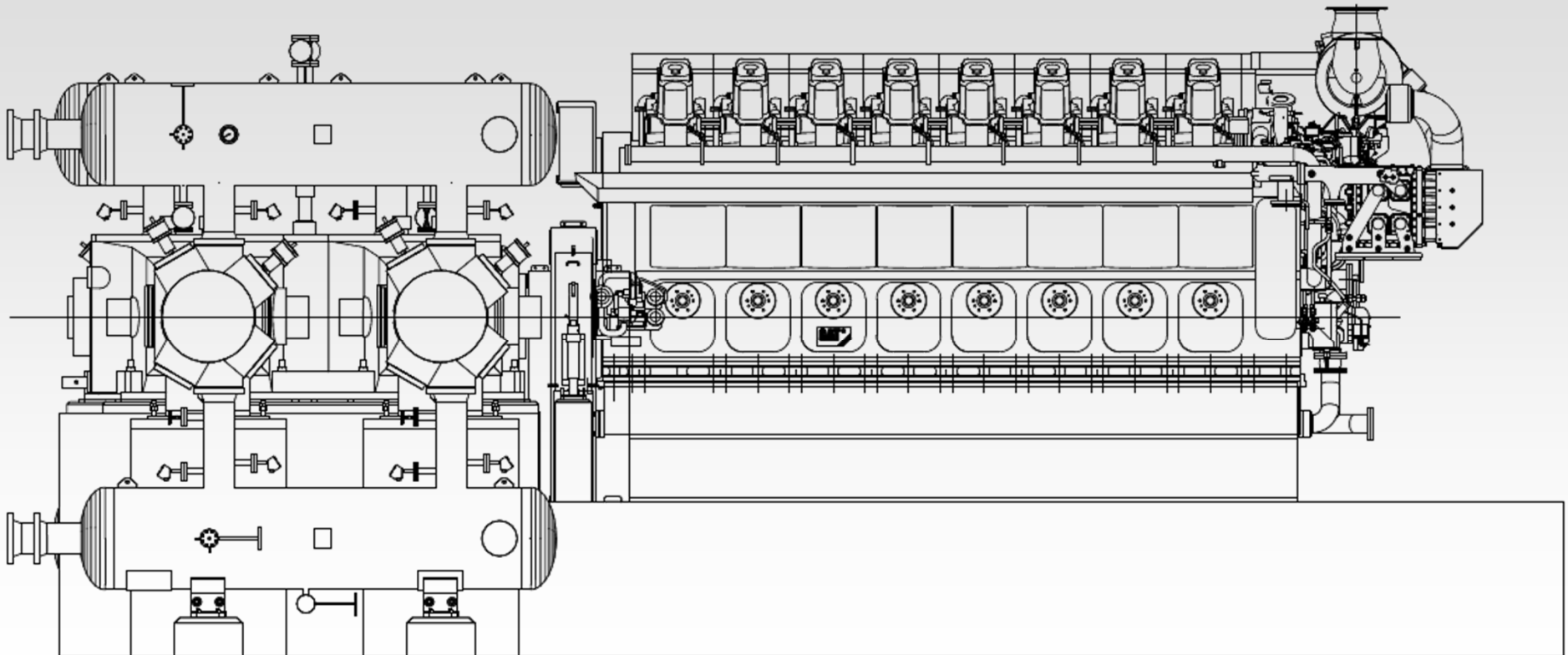
Medium Speed Compressors 450-750 RPM

NEA VL320

CAT G16CM34 Natural Gas Engine

Four-Throw Compressor

8180 BHP @ 750 RPM

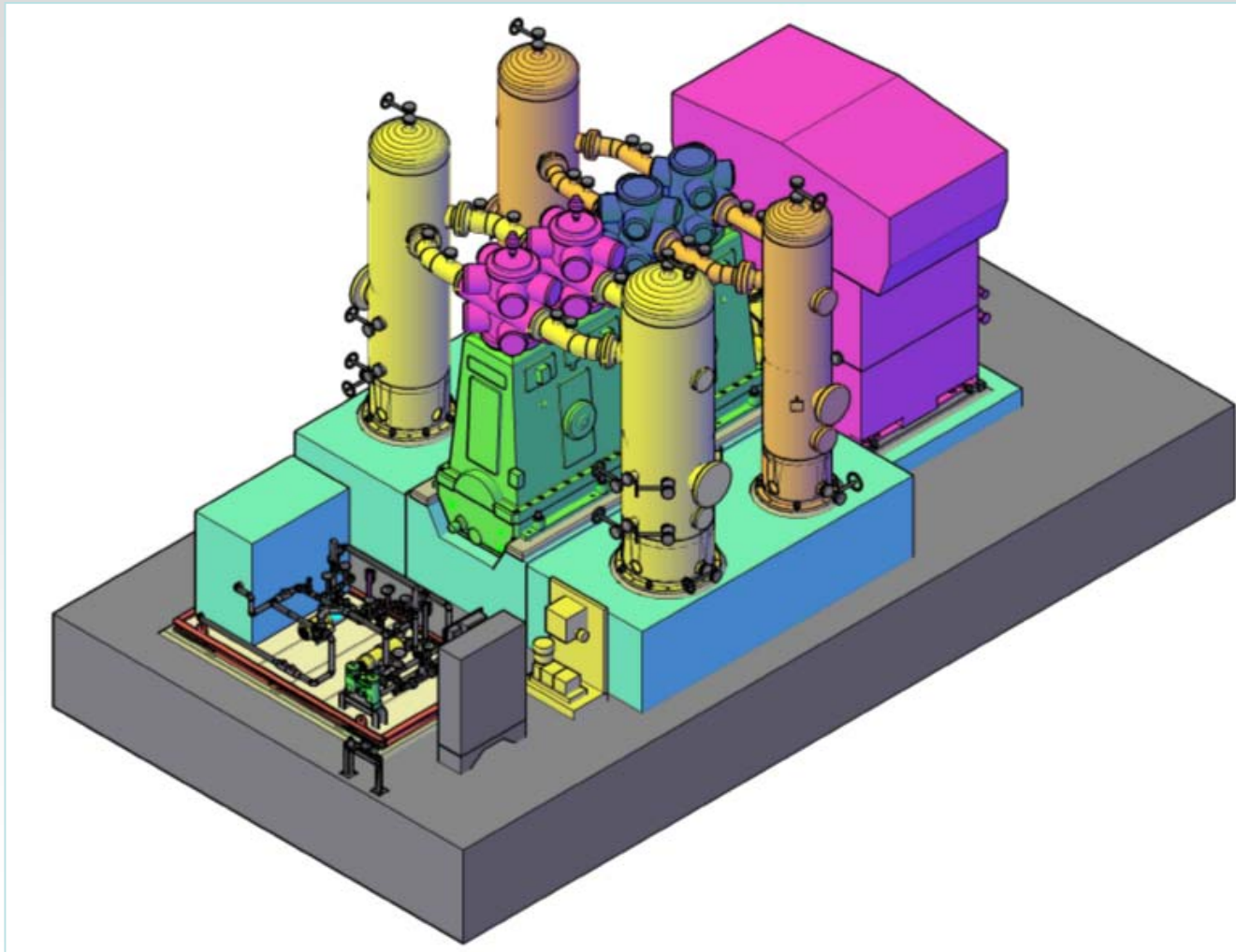


NEUMAN & ESSER USA, INC.



Slow Speed Compressors 300-600 RPM

NEA VS320 Two Stage Vertical EMD – VFD 7000 HP





NEUMAN & ESSER USA, INC.

Effective Engine Matching

- ❑ CAT G3600 Series to VL / SL320hs – 750 to 1000 RPM
- ❑ GE Waukesha 275GL+ to VL / SL320hs – 750 to 1000 RPM
- ❑ CAT G12CM34 to VL320 – 450 to 750 RPM
- ❑ CAT G16CM34 to VL320 / VL500 – 450 to 750 RPM
- ❑ Wartsila 9L34SG to VL320 – 525 to 750 RPM
- ❑ Wartsila 16V34SG to SL320/VL500 – 525 to 750 RPM
- ❑ Wartsila 20V34SG to SL320/SL500 – 525 to 750 RPM



CATERPILLAR®



GE Energy

Waukesha* gas engines
275GL*
16V 275GL +



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M004

NEUMAN & ESSER USA, INC.



Partner with Electric Motor Manufacturers



NEUMAN & ESSER USA, INC.



Work with Reliable VFD Manufacturers



ABB

Power and productivity
for a better world™



Allen-Bradley



TMEiC

We drive industry



MV AC Drive
TMdrive-XL55



TOSHIBA

Leading Innovation >>>

SIEMENS

Drive Technology

ROBICON Perfect Harmony

The Perfect Harmony of Performance, Process and Technology





NEUMAN & ESSER USA, INC.

Secret to NEA Variable Speed Success –

**Years of Experience in Advanced Drive Train Analysis & Design
Using Neuman & Esser Proprietary Torsional Design Program**

NEUMAN & ESSER

GmbH & Co. KG ■ Maschinenfabrik



Torsional vibration study

(Rev. 0)

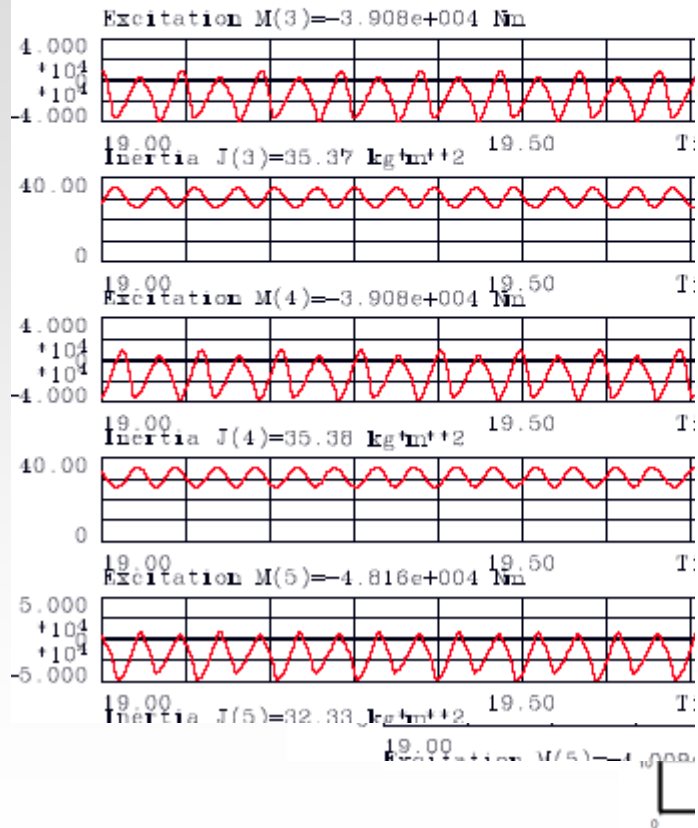
NEA Ref.:	102619
Client:	NEA USA (Ref. 311024)
for:	Billy Bob's Midstream
Site:	Eagleford, Texas, USA
Compressor:	2 SVS 320 – 0404

Appendix – Support Data with details of the design

t i m e c u r v e

2 CP open. Resonance with 19th harmonic

date: 9/26/2011 user: Namman file: ...
XRESP 7.0.2 (c) ILM, RWTH Aachen, Prof. Gold, FTA, Frankfurt



t i m e c u r v e

MAX SPEED 660RPM

date: 9/27/2011 user: Namman file: C:/DRESP/bin/109319_660rpm.2
XRESP 7.0.2 (c) ILM, RWTH Aachen, Prof. Gold, FTA, Frankfurt page



NEAC Compressor Service USA, Inc.



NEAC Compressor Service provides OEM parts, field service, repairs, and technical support for NEA compressors as well as other legacy brands



NEAC
Compressor Service



recips built in Berlin before 1996

Borsig



Demag

HALBERG