

Virgo Valves Overview

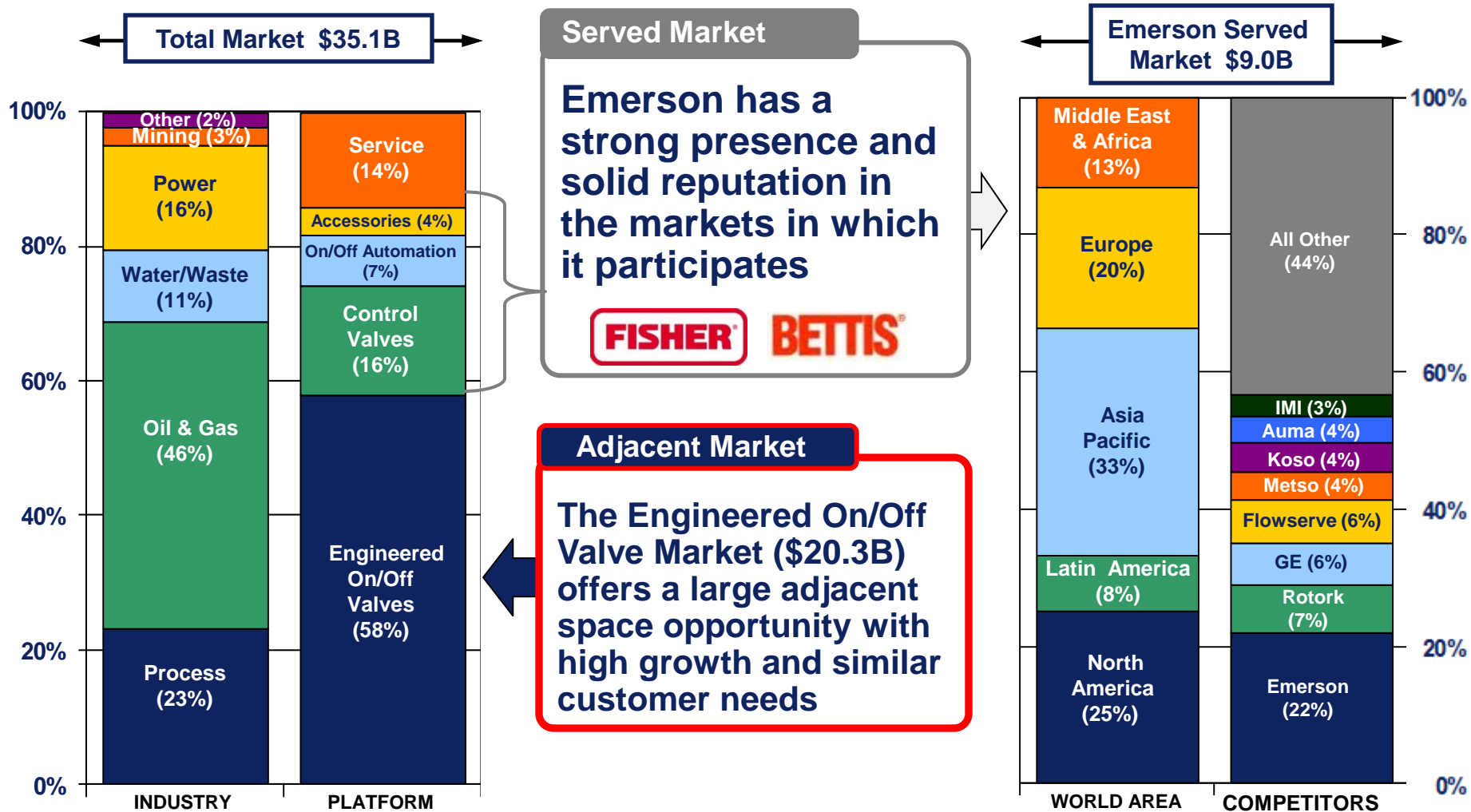
February 2015

Emanuele Rivolta



EMERSON

Introduction to Engineered Final Control Market



INDEX

- **Who We Are**

- Mission & Vision
- About Virgo
- A Decade of Growth
- Global presence
- Our Plants
- Strengths
- Management Council

- **What We Do:**

- Range of Product
- Range of Automation System
- Materials Offered

- **How We Do It:**

- Design Function
- Sophisticated machining capabilities
- Testing capabilities
- Best Practices
- OHS Policy

Who We Are

MISSION

Virgo's rapid growth in global markets is a testimony of the company's Steadfast commitment to 'Customer First' policy, combined with its unflinching adherence to high ethical standards.

Virgo continues to focus on meeting or exceeding customer expectations. In terms of product performance and on-time delivery.

VISION

To be a sustainable global leader in providing flow control solutions.

ABOUT VIRGO



Leading Manufacturer of Manual & Automated Ball Valves, Pneumatic Actuators, Gate Valves (6A) and Triple Offset Valves serving global markets



US\$ 216 million revenues in fiscal year 2012



'Approved Supplier' to leading Oil & Gas companies & Engineering Consultants



1000+ employees worldwide



Manufacturing facilities in Italy, India, & USA. Also having our own foundry in Coimbatore, India

Final Control



Caters to Oil & Gas, Chemicals & Petrochemicals, Power Generation industries etc.



13 Sales offices in 7 countries with 4 stocking locations



Twin model of delivery: Project based and Stock & Sale

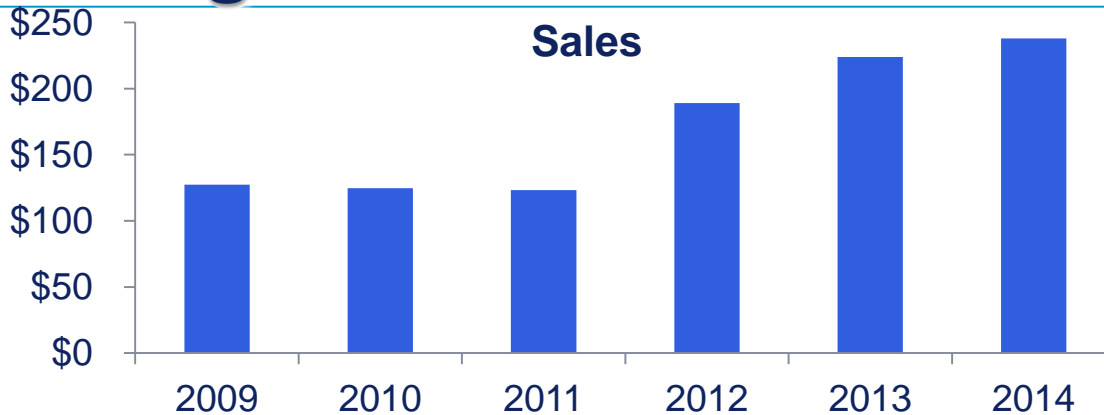


Ready available Stock valves up to 30" size

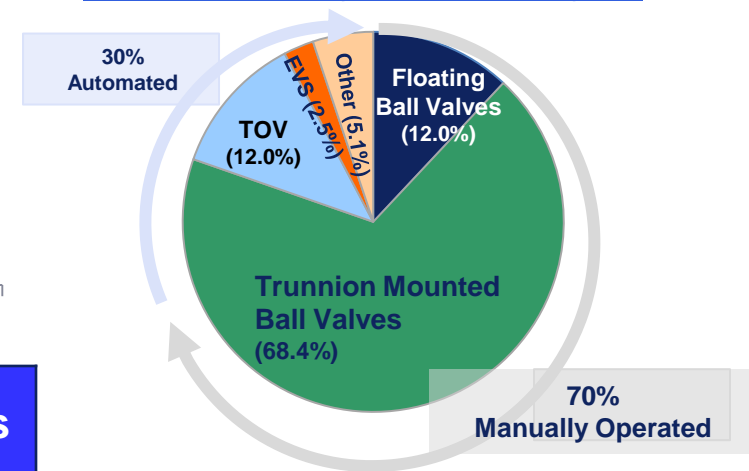


Supplies to over 2300 projects in 75 countries

Emerson Process Management Virgo Valves



2014 Sales by Product Type

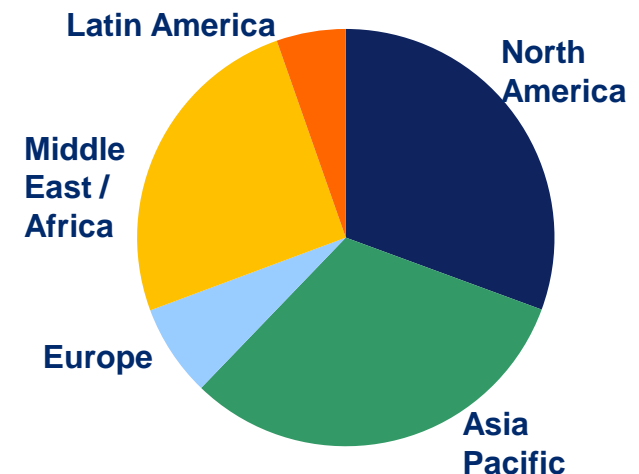


Engineered On/Off Ball, Triple Offset Butterfly Valves

- **#3 in Served Market Participation:**
- **Engineered On/Off Ball Valves for Oil & Gas**
- **Global Presence with strong EPC relationships**
- **Reputation for high quality, on-time delivery**
- **Integrated Foundry in Coimbatore**
- **8 Manufacturing Locations**
- **1,283 Employees**

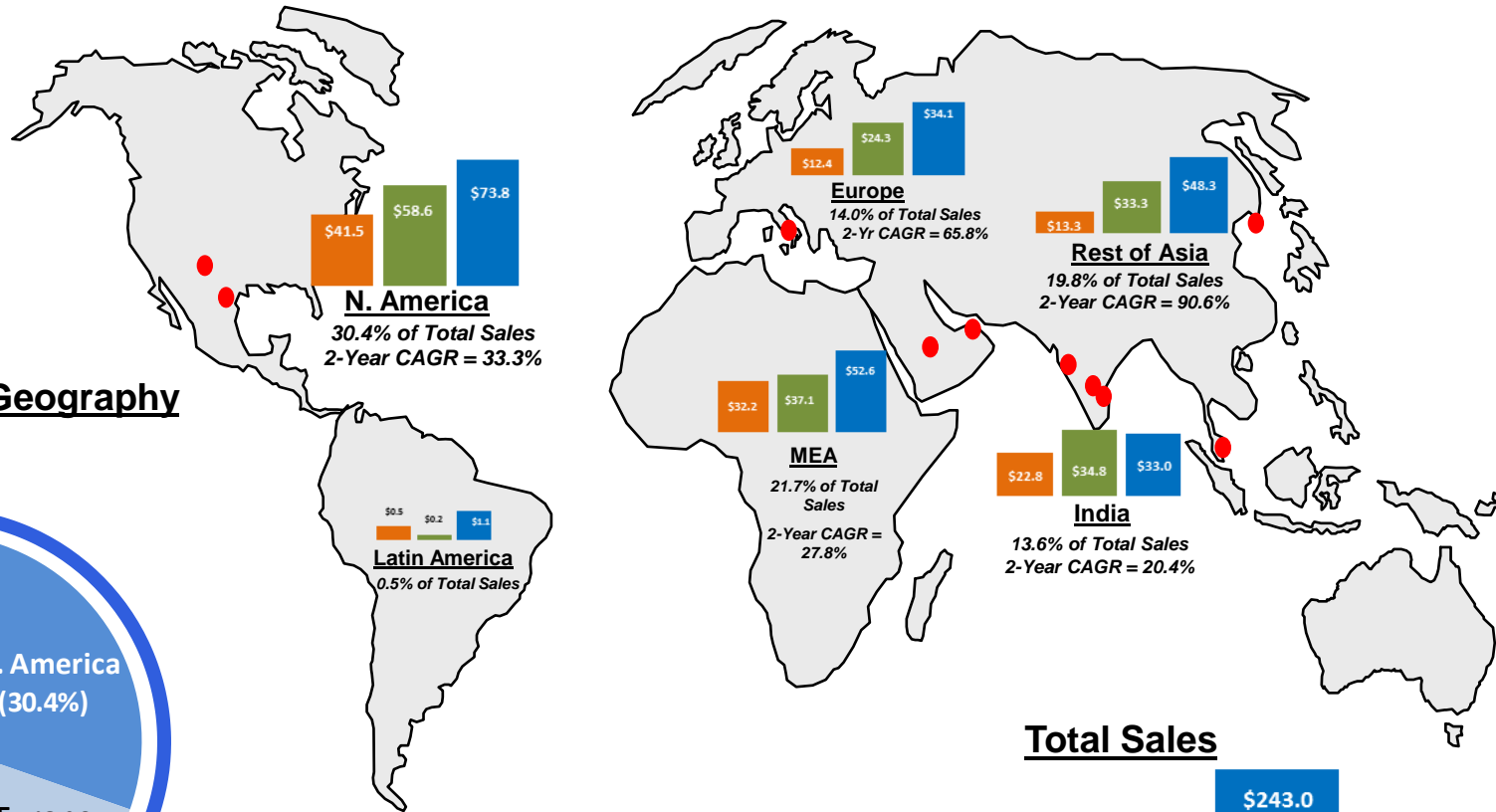


2014 Sales by Destination



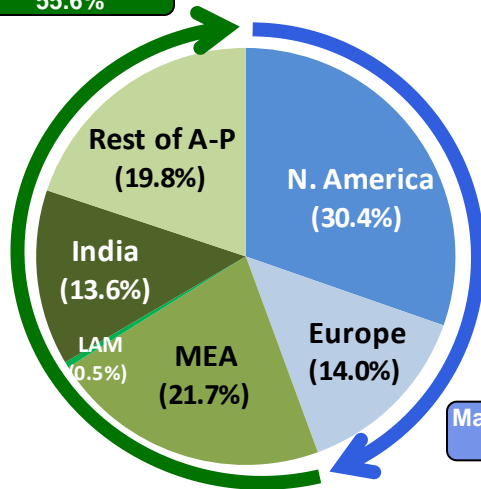
Sales – Global Presence

Sales office



FY13 Sales by Geography

Emerging Markets
55.6%



Mature Markets
44.4%

Total Sales



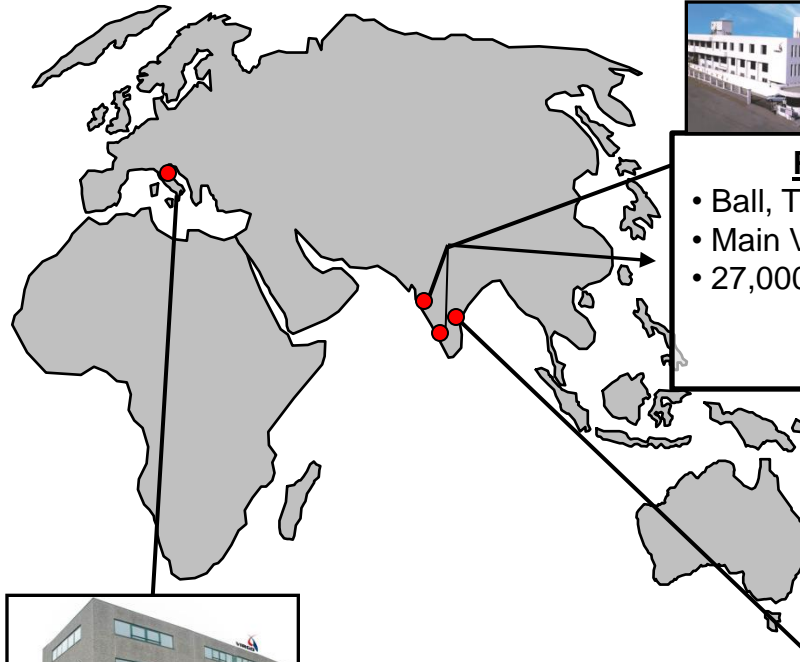
2-Year CAGR = 40.4%

Global Manufacturing Footprint



Stafford, TX

- EVS Severe Service Valves 50 – 60% local
- Virgo-USA “Master Distribution Ctr.”
- 3,500 SQM



Magnago, Italy

- Large Forged Ball, Top Entry Valves
- 70% local supply
- near Milan
- 15,000 SQM



Pune

- Ball, TOBV, etc.
- Main Virgo facility
- 27,000SQM



Coimbatore

- Captive foundry
- 300 tonne cap.
- Site also mfr's ball valves
- 13,500 SQM



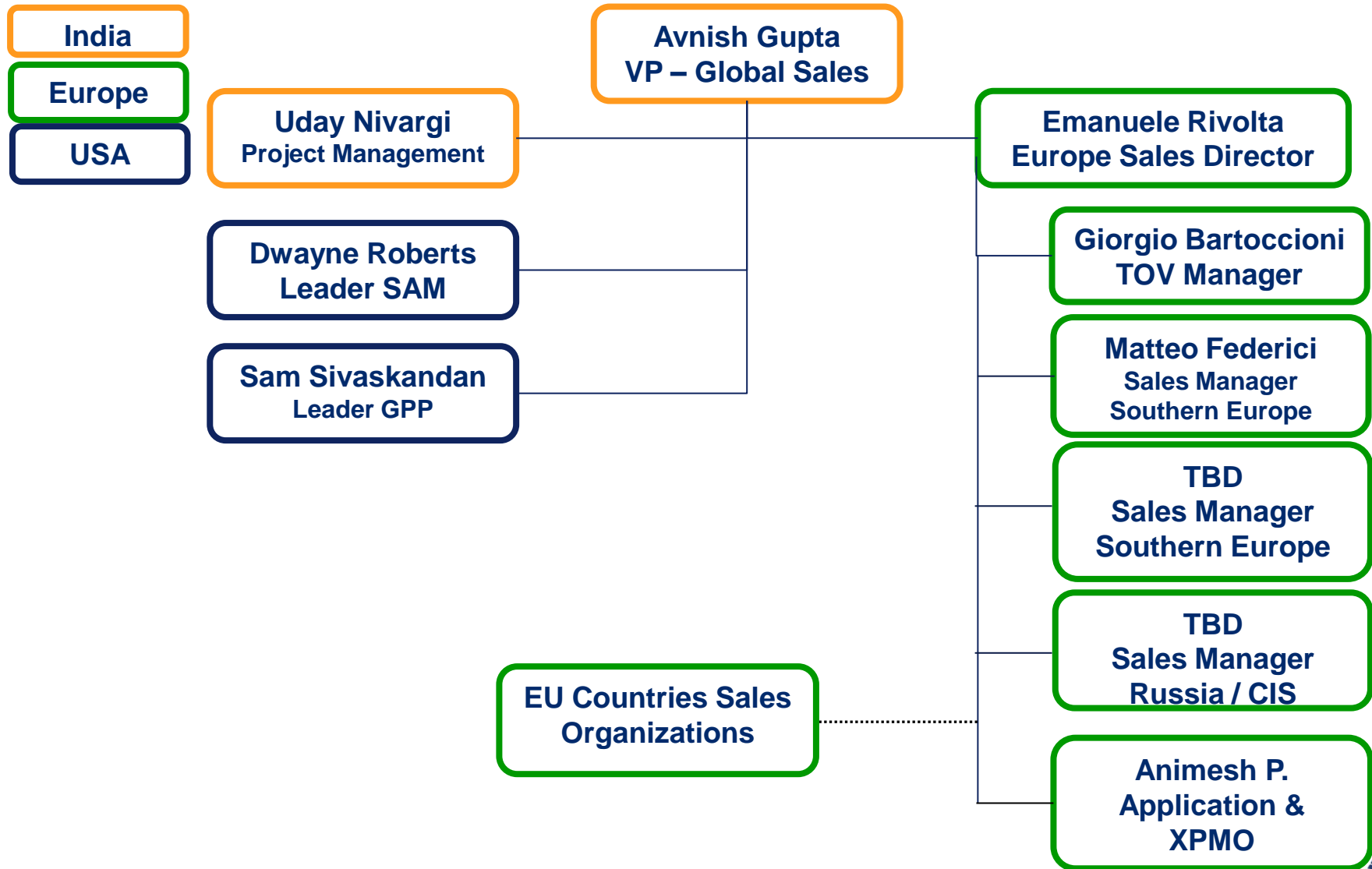
Chennai

- Export Ball valves
- Opened in 2011
- 10,000 SQM

Global Manufacturing Presence

- Nearly 700K SQFT worldwide
- *Focus on safety, quality*
- *5M man-hours accident-free in 2011*

Virgo Europe Sales Support and Organization



Virgo Europe Sales Support and Organization



India

Europe

Avinash Londhe
Technical Sales Leader

Sushil Godase
Application Team
Europe

Application Team

**5 Application
Engineers**

Carlo Santi
Technical Sales Leader

Lorenzo Ferrari
Application TL Europe

Application Team

**8 Application
Engineers**

VIRGO ITALY, Milan



VIRGO ITALY Workshop overview



VIRGO PUNE-PHASE I, INDIA



VIRGO PUNE-PHASE II, INDIA



- **Ball Manufacturing & Coating Facility**

VIRGO COIMBATORE, INDIA



VIRGO CHENNAI, INDIA



Virgo's Own Foundry - Chennai



VIRGO-EVS TEXAS, USA



- **Severe Service Ball Valves**

Strengths



Prudent and ethical management	Technology- Synergy among Global Design Teams and Virgo group production Capability
Top class infrastructure for design, manufacturing and after sales service	International Advantages from Virgo Group Sales organization structure
Having our own Foundry	Supply Chain- Common Global Sourcing Teams to facilitate access to worldwide suppliers
Product Quality & Certifications	Capability of meeting complex requirements
Customer first approach	

What we do - Virgo Valves Family of Products



Trunnion Mounted Ball Valves

2" - 60"

**ANSI 150# - 2500# -
RF, RTJ, BWE
API 5000 - 15000**

- API 6D, API 6A
- ASME VIII/ ASME B16.34
- Fire safe API 607/6FA
- NACE
- Blow out proof stem
- Bidirectional sealing
- Low Torques
- Multiple stem seals
- Double block & bleed
- Pigable
- Zero Leakage
- Fugitive emission compliant



Floating Ball Valves

1/2" - 10"

**ANSI 150# - 1500#
RF, RTJ, NPT**

- API 6D / ASME B16.34
- Fire safe API 607/6FA
- NACE
- Blow out proof stem
- Bidirectional sealing
- Low Torques
- Multiple sealing stem
- Zero Leakage
- Fugitive emission compliant



**Triple Offset
Butterfly Valves**

3" - 56"

**ANSI 150# - 900#
Lug, DF, Long Pattern**

- API 609 / ASME B16.34
- Fire safe API 607/6FA
- NACE
- Zero leakage
- Triple eccentric minimizes wear during stroke
- Bi-directional sealing
- Low torque
- Blow out proof stem
- Replaceable seal ring

Floating design

Floating Design: ½" to 10"
#150, 300, 600, 800, 900/1500 & 2500

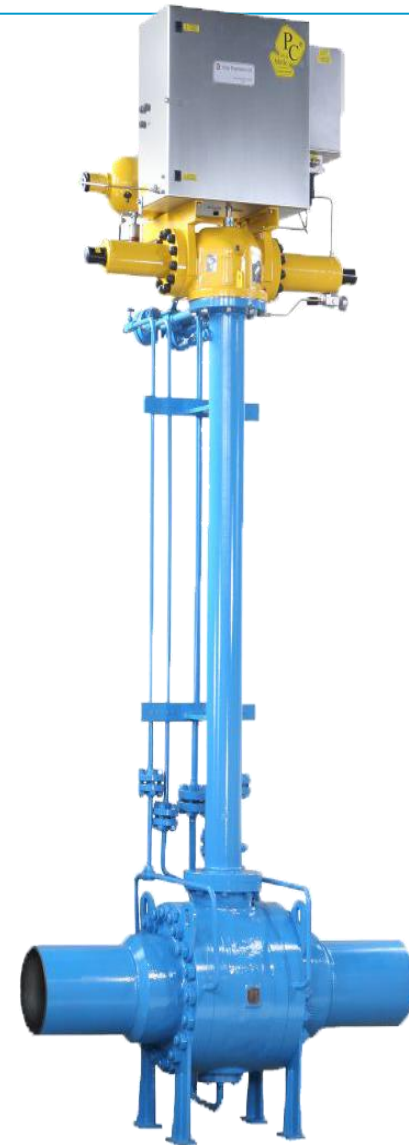


Back

Final Control

Trunnion Mounted Ball Valves

Trunnion Mounted: Ball Valves: 2" to 60"
#150 to #2500, API 15000



Top Entry & Fully Welded Ball Valves

Top Entry & Fully welded Ball Valves: 3" to 60"
#150 to #2500



Back

Final Control

Triple Offset Butterfly Valves - TOVs

End Connection: Double Flanged, Lug, BW
3" to 48", #150 thru #900

Large Size Triple Offset Valve:
30" x 150# to Shell Gumusat Kakap FPSO



Automation Capability - AVPs



SHUT DOWN VALVES

EMERGENCY SHUT DOWN VALVES

HIPPS

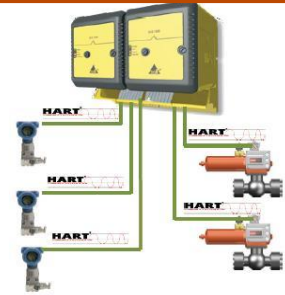
ELECTRIC MOTOR OPERATED VALVES

GAS/GAS OVER OIL ACTUATOR SYSTEM



Safety Instrumented System (SIS) Business Level Solution

SIS



HIPPS



Simple SIS



ESD



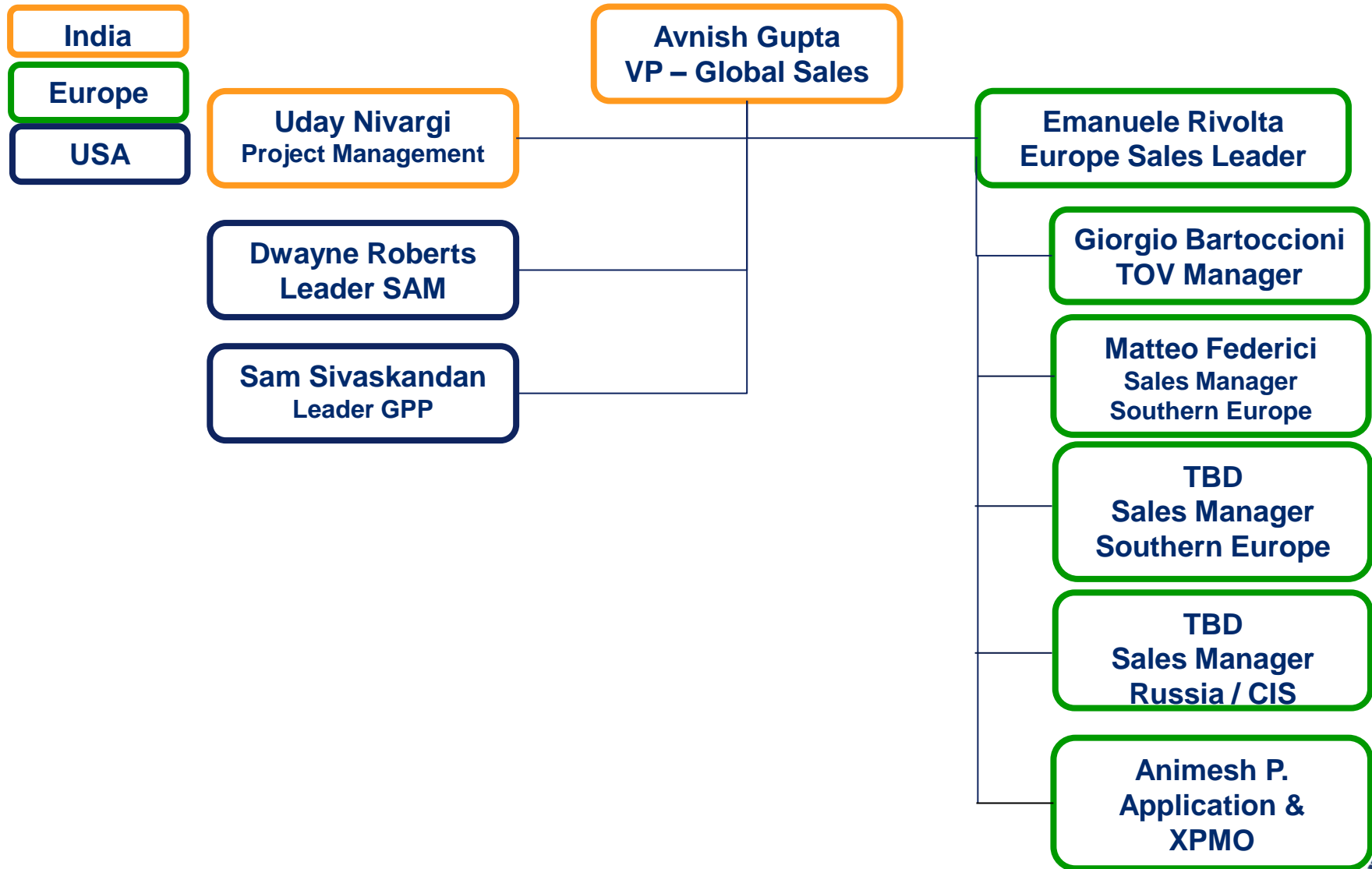
- Annual SIS On/Off Valve Market ~\$200M
- Final Control market participation ~18%
- High Integrity Pressure Protection Systems (HIPPS)

Recent Major HIPPS Wins at Unit / Point Level:

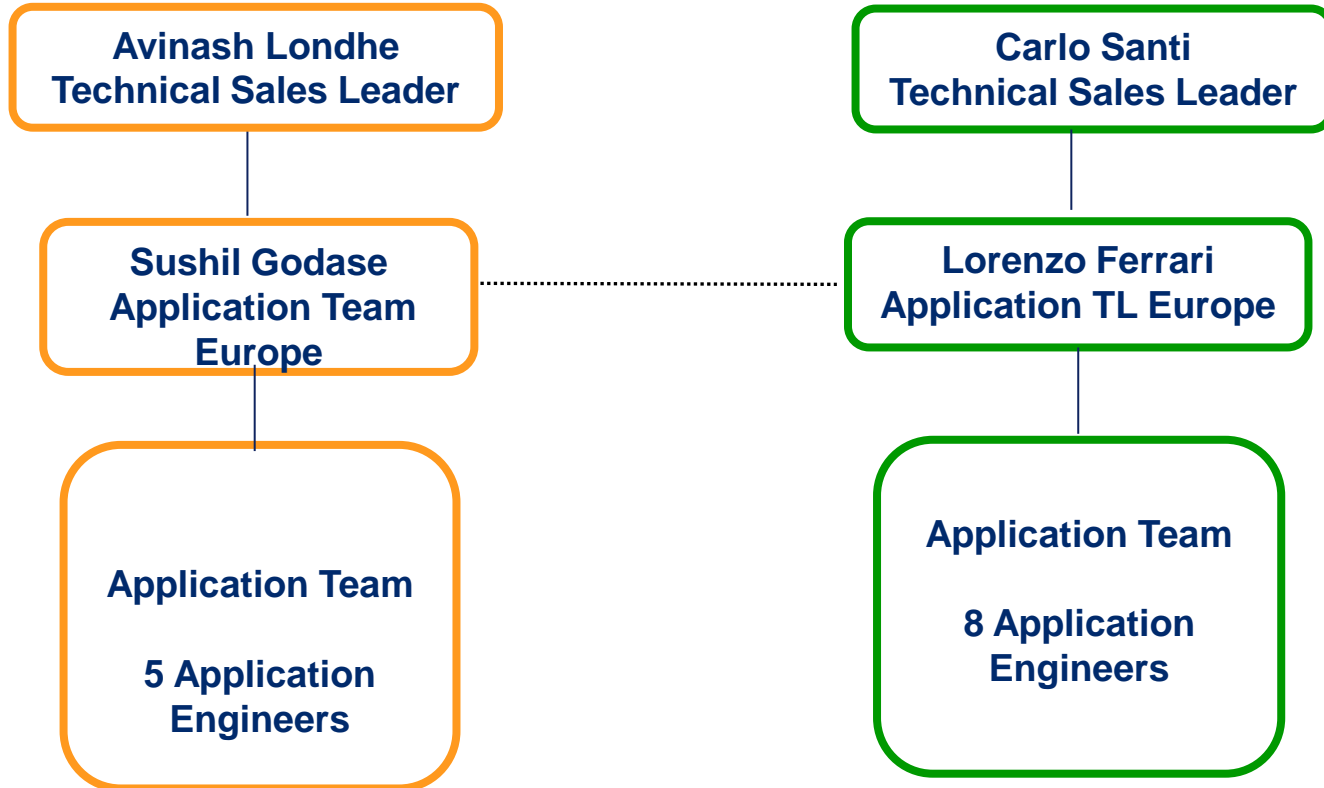
- Aqaba LNG – Jordan
- Gorgon LNG, Chevron, Australia
- Forvie Alwyn, Total, UK
- Fortis Alpha, Apache, UK
- Liwan, CNOOC, China
- Karan Gas, Saudi



Virgo Europe Sales Support and Organization



Virgo Europe Sales Support and Organization



Materials Offered

Carbon steel,
Low temp.
Carbon steel

Duplex/Super
Duplex SS
(4A/5A/6A)

Inconel &
Monel

Carbon steel with
St. Steel & Inconel
Overlays

Stainless
Steel

Super Austenitic
Stainless Steel

Hastelloy

How We Do It - Design Function

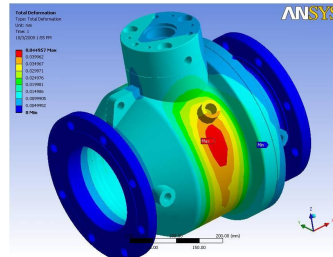


Strong in-house design team for:

- Fulfillment of Orders
- New Product Development

ENGINEERS
45

DRAFTSMEN
25



Design Tools used:

- AutoCAD
- Pro-E
- Design automation through Pro-E & backend programming languages like VB, Java etc.
- Finite Element Analysis through ANSYS
- Product Life Management of PTC Windchill
- BaaN LN-ERP



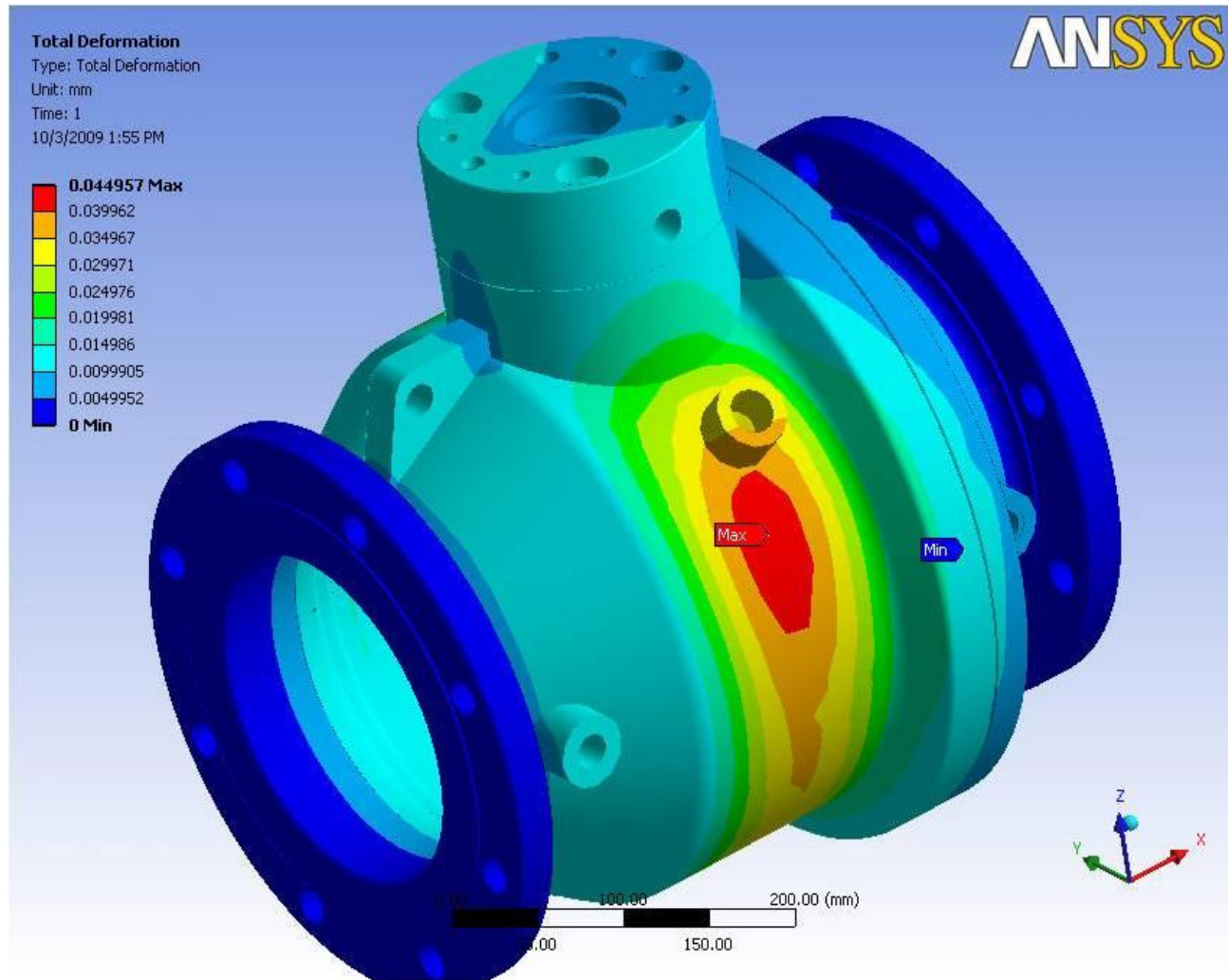
New Product Development (NPD) Cycle

Verification of design thru all calculations conforming to recognized international standards and thru FEA & Assembly Simulation

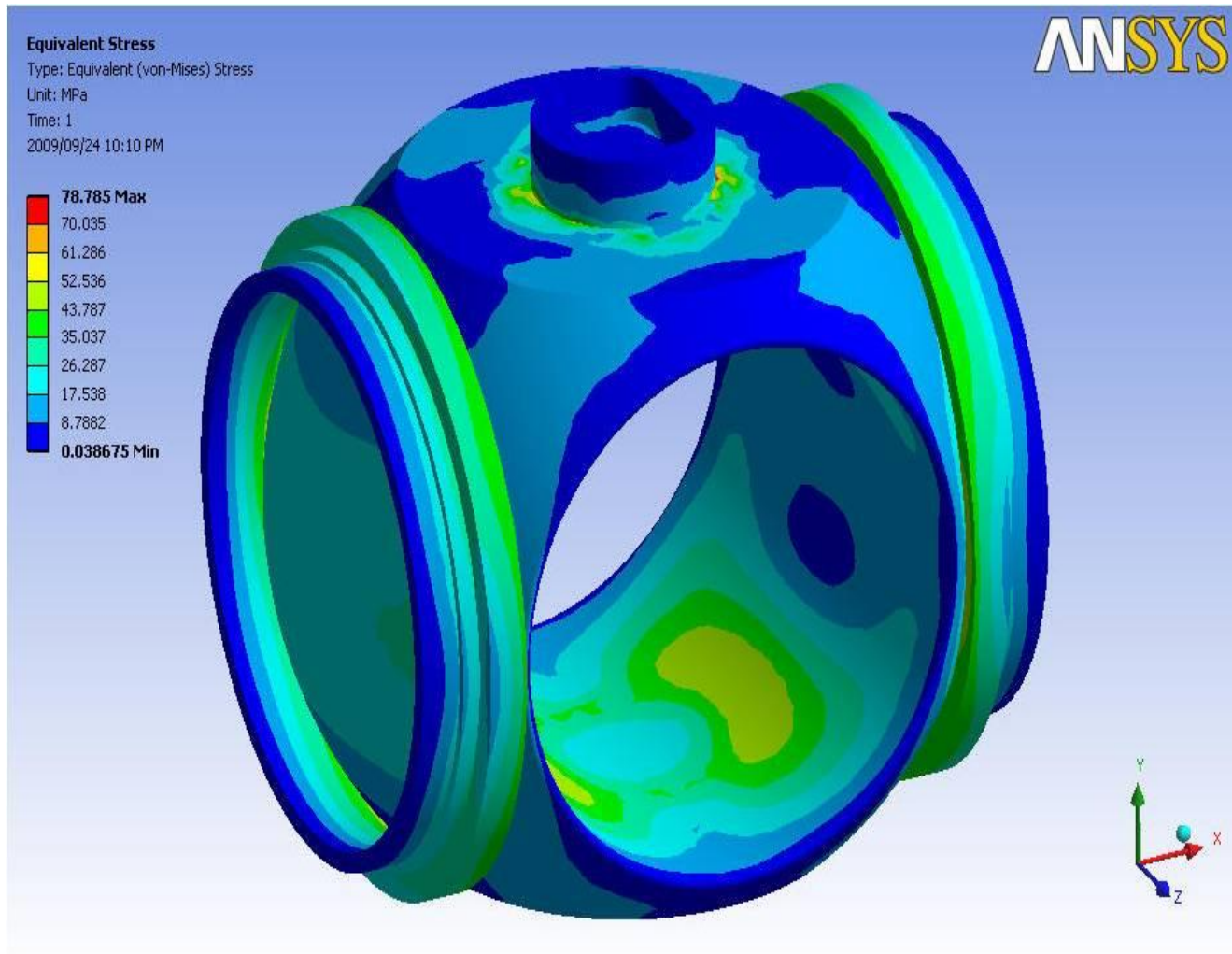
Pilot batch validation

Prototype sample validation through rigorous physical testing

Virgo design analysis simulated with Ansys Product development suite



VIRGO Design analysis simulated with Ansys Product development suite



High End Machining Capabilities



High End Machining Capabilities



Final Control

Special processes

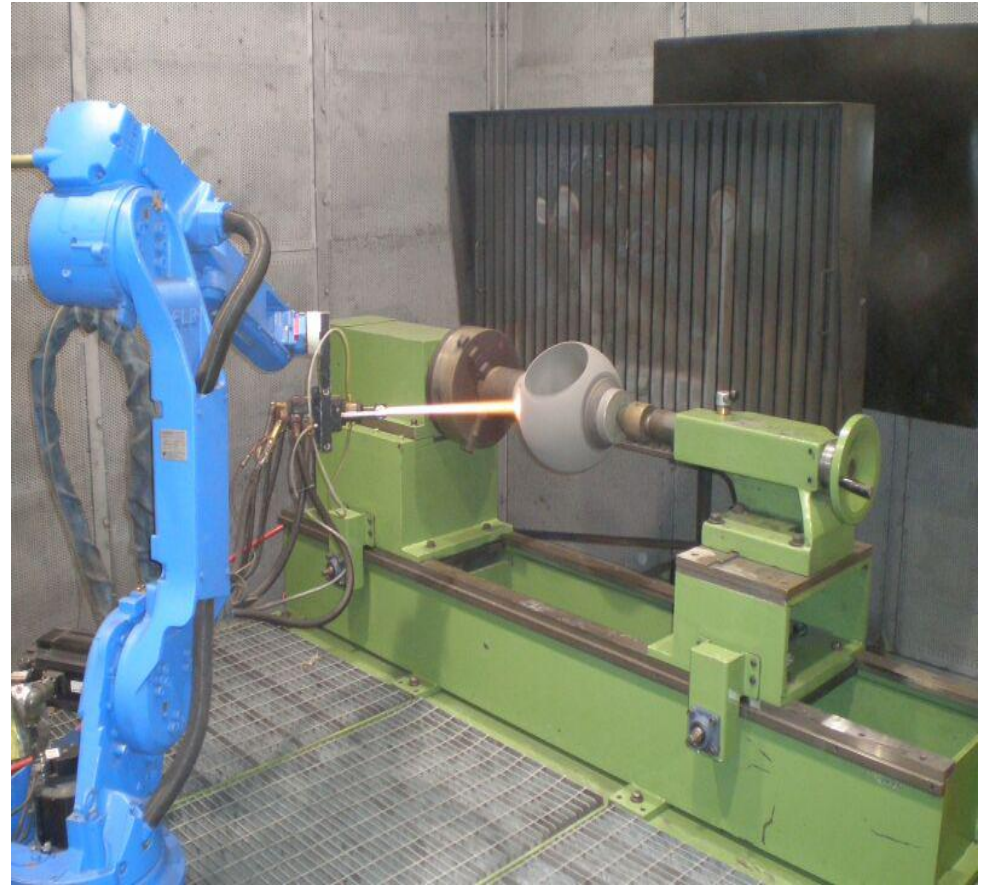
Weld Overlay



Metal seated ball valves

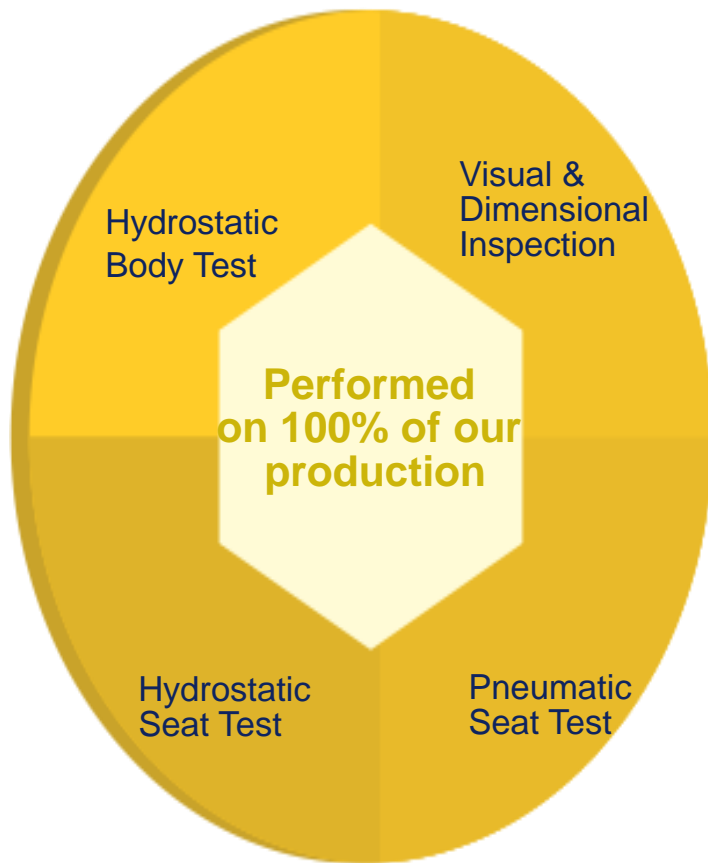
Metal Seated Ball Valves: ½” to 60”
#150 to #2500

- **Coating:** in Tungsten Carbide & Chrome Carbide
- **In house High Velocity Oxygen Fuel (HVOF) coating facility.**
- **Leakage Rates :** API 598, ISO 5208
- **Fugitive Emission Testing :** ISO 15848, MESC 77-312



Test Specification & Capabilities

Performed as per Project Requirement



Fugitive Emission testing as per ISO 15848 and MESC	Low temperature testing as per BS6364 & Shell-MESC specs	High Pressure Nitrogen testing
Vacuum testing (Helium leak detection)	IGC & Microstructure testing for St. Steel, Duplex St. Steel.	NDE viz. Radiography, MP, DP/LP, Ultrasound testing.
Alloy Verification (Positive Material Identification).	Corrosion testing	SSC & HIC testing as per NACE TM 177 & NACE TM 284

Test Specifications and Capabilities

Pressure Testing - API 6D / API 598 / ISO 5208 / API6A



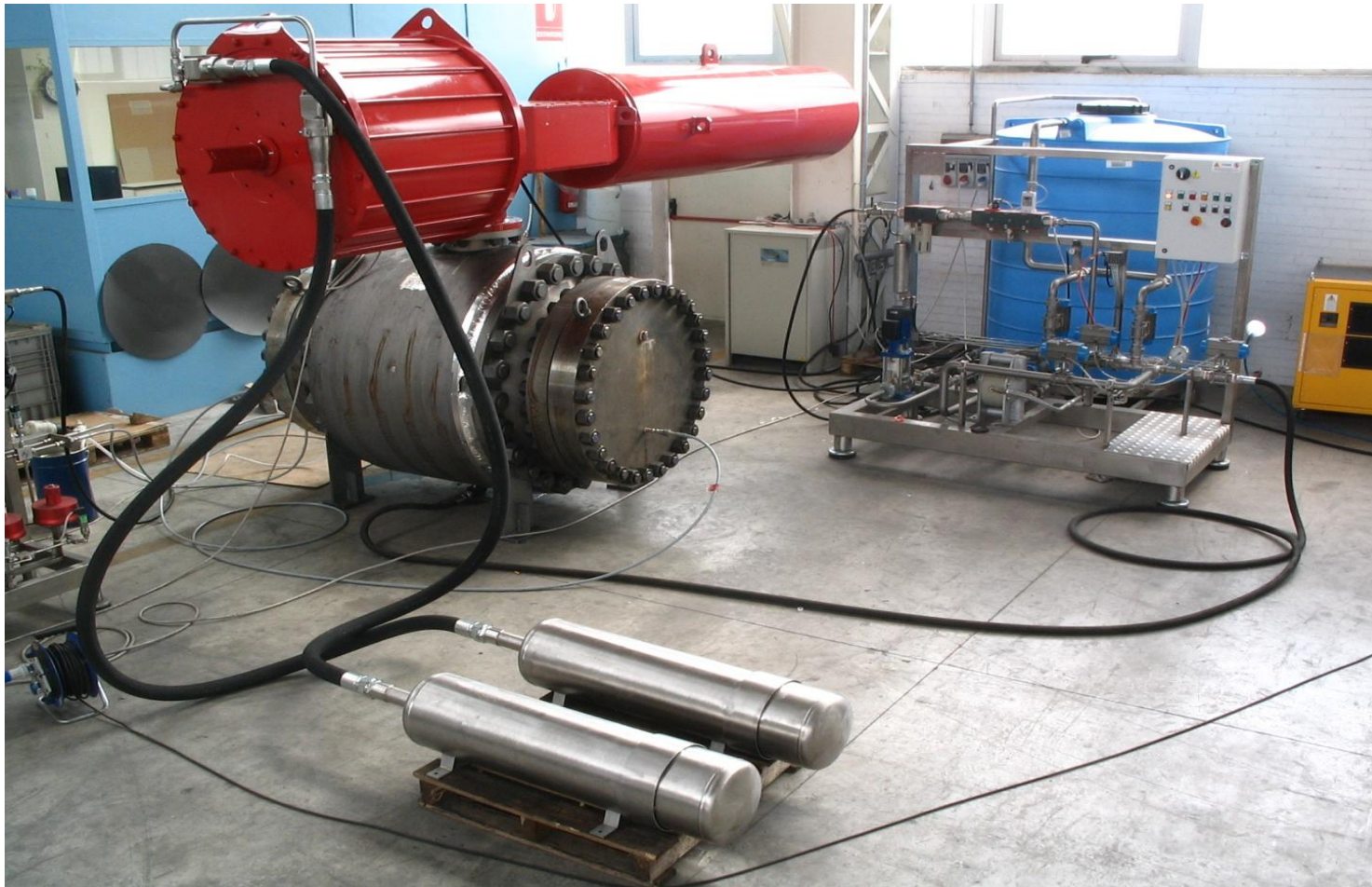
Test Specifications and Capabilities

Test Area – Functional Test Of 24” 2500# with Blind Hubs



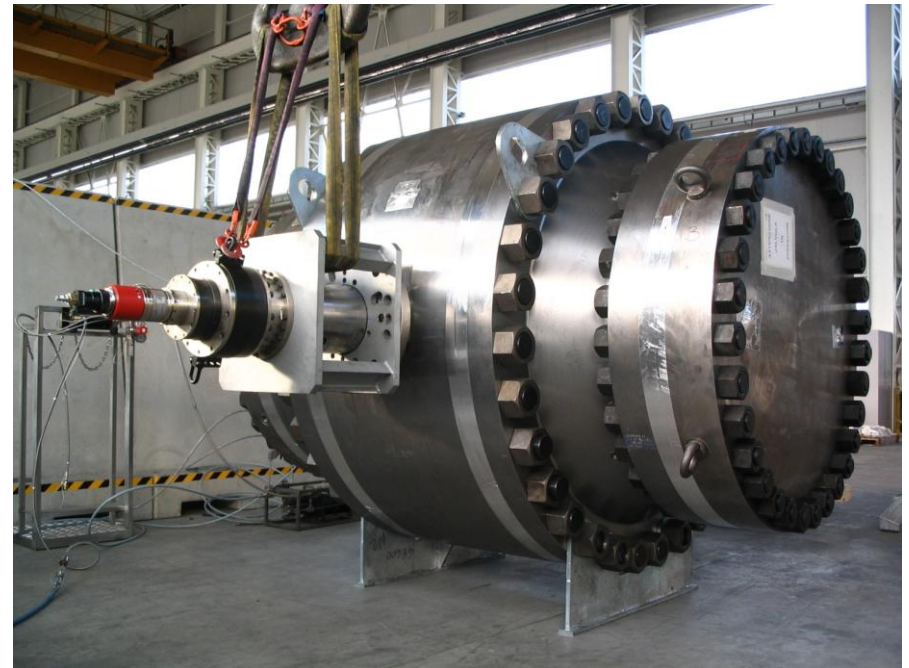
Test Specifications and Capabilities

Cyclic testing with pneumatic actuator



Test Specifications and Capabilities

- TAT & Fugitive Emission testing per Shell- MESC
- API 6A PR2 Testing
- Cryogenic testing to BS6364 (-196 deg C)

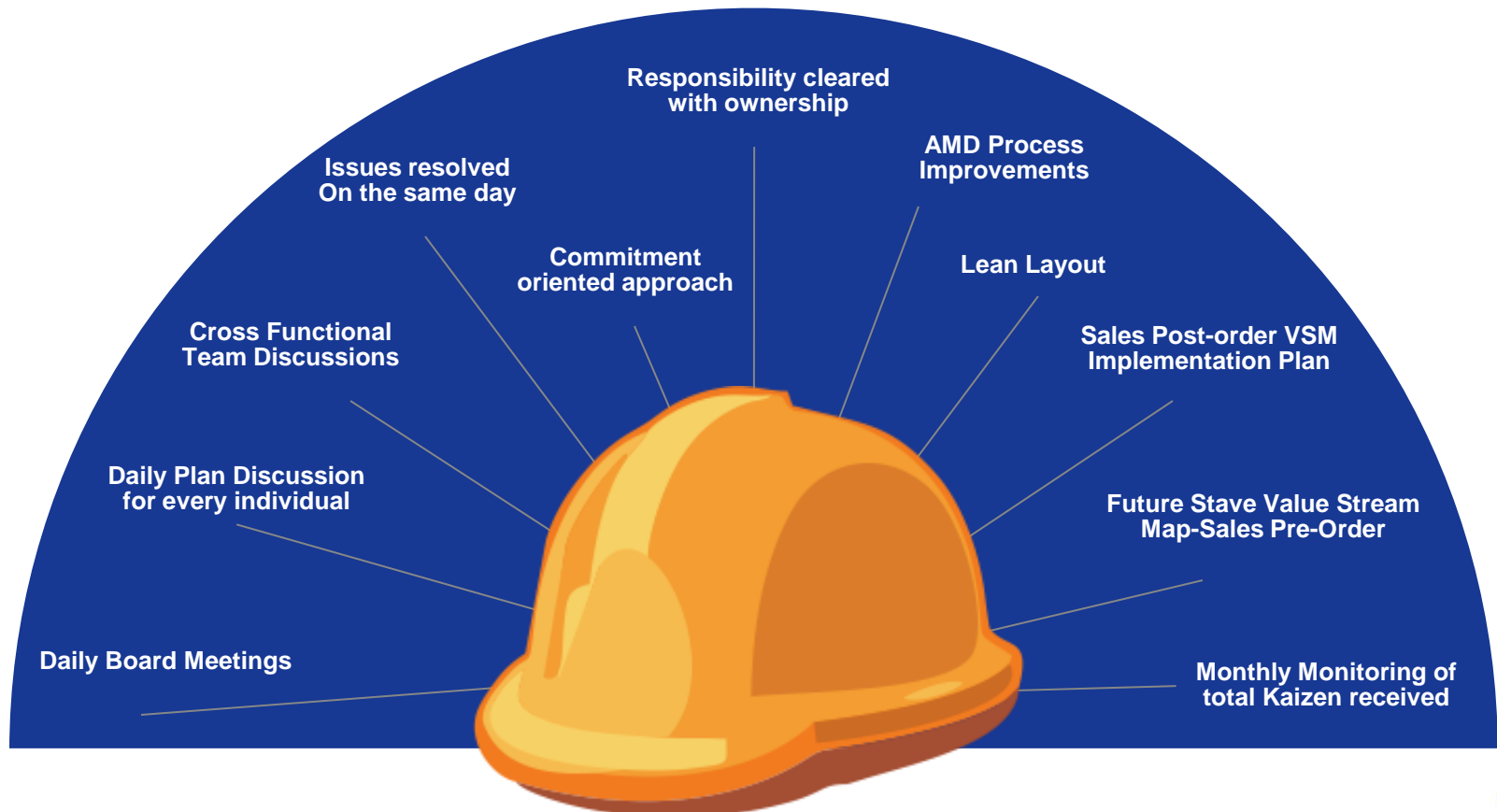


Supply Chain Management and QA

- QMS System Common to ALL manufacturing locations – ISO 9001
- Castings from selected vendors Eastern Europe and Asia
- Forgings from EU /Italy
- Total Approved vendors also for
 - ENP
 - TC up to 400nm
- 100% incoming material QC



Best Practices



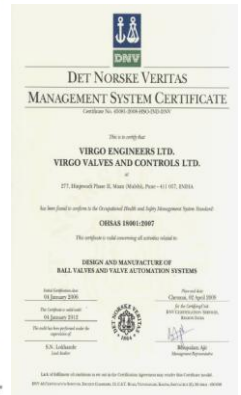
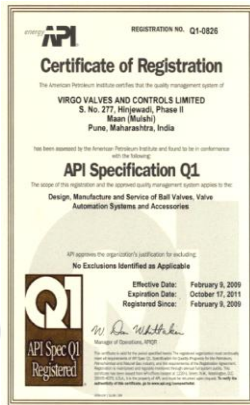
Quality



Certification

- ✓ ISO 9001-2008
- ✓ API 6D & API Q1
- ✓ API 6A
- ✓ SIL 3 – Safety Integrity Level
- ✓ CE /PED 97/23/EC
- ✓ GOST Russia

- ✓ Atex
- ✓ API607 – API6FA Fire Safety Certification by Lloyds / EIL
- ✓ OHSAS 18001
- ✓ Fugitive Emission Qualification as per ISO 15848, TA - Luft and MESG



Final Control

Approvals from Oil & Gas Companies Worldwide

- ✓ Shell GSI & Group Companies
- ✓ Chevron
- ✓ ExxonMobil
- ✓ Saudi : Saudi Aramco, SABIC, Sasol etc.
- ✓ India: IOCL, GAIL, ONGC, Reliance
- ✓ Petroleum, BG, BPCL, HPCL &
- ✓ Cairn Energy Petrobras, Brazil
- ✓ Qatar: Oxy, QP , Qatar Gas, QAFCO
- ✓ ADCO, Takreer, ADMA & GASCO, Abu Dhabi
- ✓ Oman :PDO & OGC
- ✓ KOC & KNPC Kuwait
- ✓ Petronas, Murphy Oil Malaysia
- ✓ BAPCO, Banagas
- ✓ Repsol , Pemex & more



Dear Virgo Engineers Ltd.

On behalf of Shell Canada.

We are pleased to confirm that Virgo Engineers Ltd., has been approved to supply the valve products described in Tab 1 of our "VENDOR" Value-Approved Manufacturer List, which Operating sites and Engineering Contractors work on the

This acceptance is subject to manufacturer's own manufacturing standards and specifications. Actual goods delivered in accordance with specific engineering requirements shall be subject to inspection and approval by the manufacturer for selection of the product as required on a case by case basis

The acceptance of products listed in Tab 1 of our "VENDOR" Value-Approved Manufacturer List, which Operating sites and Engineering Contractors work on the

By accepting the status of Shell Accepted Manufacturer we assume to be the manufacturer's responsibility to a comply with any no-accident the business changes, (i) Product changes; (ii) Ownership changes;

The status of Shell Accepted Manufacturer will continue until product and Shell is an Accepted Manufacturer.

This acceptance is valid for two years manufacturer will be subject to a periodic audit and NCR operations.

قطر للهندسة
Qatar Engineers

Materials Department (Engineer & Inspector)
1st Floor, Navigation Plaza Bldg, C Ring Road
P.O. BOX 1022, Doha, QATAR. Website: qe.com.qa

To: Virgo Valves & Controls Limited	From: AMEL AZIZ AL-TALIBI
File: 011215481	File: 0074-0426154
Attn: ASHWIN SHETTY	Phone: 00974 426222
Date: 07/11/2007	Web: building.com.qa
CC: SA/MP/AM/ML/	Ref: MTL/VA/0002007

Subject: Vendor/Manufacturer/Supplier Approval

Please be advised that the submission to become an approved Vendor/Supplier/Manufacturer with Qatar Petroleum has been accepted and your company has been included in the approved list of the following product groups. The acceptance is contingent upon your continuous adherence to Qatar Petroleum (QP) Quality Standards, specifications and regulations/requirements.

S.N.	Group	Comments/Description
1	7700	Ball Valves
2	7710	Butterfly Valves

The above product group(s) is/are in accordance with QP Quality Requirements for Vendor/Manufacturer/OP will consider that your company is notified with the products coding and categorization if there is no formal request for changes. If at any time in a future procurement change such that your company is no longer able to comply with the qualification criteria for this Product Group, your company must formally advise QP immediately. QP reserves the right to remove your company name from the approved supplier list in its discretion and without notification.

QP approval is valid until 01/11/2010

Should there be any changes to your company's profile (i.e. name, address, telephone, fax, e-mail or termination of agency agreement, operational change (company only), QP (MTL) must be notified immediately.

Interval of re-approval with Qatar Petroleum must be applied 4 (four) weeks before the expiration date.

Regards,

Aglo KCO

Aglo Manufacturing Company Building, P.O. Box 1000, Doha, Qatar. Tel: +974 4411 1111. Fax: +974 4411 1112. Email: info@aglo.com.qa. Website: www.aglo.com.qa

To: Virgo Valves & Controls Limited
275, Elgawah, P.O. Box 11, Meen, Mubail
40027
P.O. Box: 01

Date: 07/11/2007

Mr. Ajithesh Desai, President
Virgo Engineers Ltd., Virgo Valves & Controls Ltd.
122/15, Promenade Road
Stamford, TX 77127

ATTENTION: Mr. Ajithesh Desai - President

SUBJECT: APPROVED VALVE MANUFACTURER NOTICE

Ball Valves: Size 1/2" thru 50", Class 150 thru 2500, API 6D / BS 68 / ISO 17221 / Shell Gate Expanding Gate Valves, Check Valves & Tapping Head & Tapping Check Valves API 6D

Plant: Engineering Plaza B, Meen (Mubail), P.O. Box 1007, India.
Wellhead Production Division, MIDC Bhamburda, P.O. Box 41, India.

Foundries: Shah Petroleum Pvt. Ltd. MIDC, Koyamb, Sangli, 416404, India
Gajpet Irons Limited / Inductec Pvt. Ltd. Rajahmundry, India.
Ironex Cast Pvt Ltd / Inductec Technopark Pvt Ltd, Nandikotkur

The purpose of this letter is to confirm to you that Virgo Valves, has satisfied Chevron's Vendor Approval Program. This approval status will remain in effect until 01/11/2010 at which time Chevron plans to again review the performance of your time. Chevron may conduct random inspections of your facilities and/or its necessary.

Listed above are the major suppliers for Virgo Valves and the other suppliers listed were not notified but are approved per the audits performed and maintained. Any changes in the subcontractor network, location of manufacturing or material sources of major process containing components shall be reported to Chevron's Technology Company within 20 days of the change. Failure to do so could result in being removed from the Approved Valves Manufacturer's List.

If you have any questions or comments, please do not hesitate to contact me at (713) 754-4256.

Sincerely,
Ashwin Shetty
Ashwin Shetty
Staff Engineer - Piping and Valves
Chevron Corp.
Energy Technology Company
ashj@chevron.com

Virgo Valves & Controls Limited
Via Yamato 13
20010 Vesio, Italy
Tel: +39 051 251100
Fax: +39 051 251100
E: info@virgovalves.com

VIRGO EUROPE SPA
ATTN: MANAGER DIRECTOR
VIA YAMATO 13
20010 VESIO
ITALY
Lodi, September 04, 2008

INDEX: LAST EVALUATION
Suppliers (APPROVED)
Vendor ID: 0002007 - Plant ID: 0004400

Dear Sir/Madam,
The plant evaluation on July 17th, 2008 resulted in a "Quality System Approval" status.
As a result we are pleased to advise you that your company is approved with limitations to supply the material list of VENDOR (see Attachment)

This approval is granted for your manufacturing plant VIRGO EUROPE SPA in VARESE, ITALY.
The approval is valid until 01/11/2010. The approval is granted by AOC in accordance with the following conditions, your company will have the opportunity along with other approved suppliers to respond to requests for submitting proposals to purchase with AOC's established system and procedures.

AOC would like to take this opportunity and thank you for your interest in doing business with AOC's fluid control. Please use the above referenced Vendor ID and Plant ID in all future written correspondence.

Yours faithfully,
Ashwin Shetty
Ashwin Shetty
Staff Engineer - Piping and Valves
Chevron Technology Company

Attachment:
1. AOC's responsibility of a manufacturer to notify Approved Supplier Selection Group of the following:
a. Change of ownership
2. Any change of manufacturing location (not including relocation of major components)
3. Discontinuance of Operations (closure of facility)



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Sincerely,
Ashwin Shetty
Ashwin Shetty
Staff Engineer - Piping and Valves
Chevron Corp.
Energy Technology Company
ashj@chevron.com

VALVE MANUFACTURER OR RECONDITIONER APPROVAL RECORD

APPROVAL REQUESTED BY: Virgo Engineers Ltd.
275, Elgawah, P.O. Box 11, Meen, Mubail 40027, Saudi Arabia

APPROVED PRODUCT & SIZE:
Ball Valves: 1/2" thru 50", Class 150 thru 2500, API 6D / BS 68 / ISO 17221 / Shell Gate Expanding Gate Valves, Check Valves & Tapping Head & Tapping Check Valves API 6D

PRODUCT & SIZE NOT APPROVED:

DATE: 07/11/2007

Registrations with International E&C companies

- ✓ ABB
- ✓ Aker
Kvaerner
- ✓ Bechtel
- ✓ CB & I
- ✓ CCC
- ✓ Chiyoda
- ✓ Clough
- ✓ DAELIM
- ✓ EIL
- ✓ Foster
Wheeler
- ✓ Fluor
- ✓ Hyundai
- ✓ GS E&C
- ✓ JRM
- ✓ JGC –
Japan
- ✓ KBR
- ✓ MW Kellogs
- ✓ MMHE
- ✓ Modec
- ✓ NPCC
- ✓ Petrofac
- ✓ Petronas
- ✓ Ranhill
Worley
- ✓ Samsung
- ✓ SK E&C
- ✓ Sime Darby
- ✓ Saipem
- ✓ SBM
- ✓ Techint
- ✓ TR Spain
- ✓ Technip
- ✓ Tecnimont
- ✓ Woodside
- ✓ Worley
Parsons
- ✓ URS
Washington

VIRGO VALVES

THANK YOU