Integrated Smart Solutions
Brochure

INTEGRATED
SMART
SOLUTIONS

BY

AMPO
POYAM VALVES
Commitment made of steel

1. COMPANY PROFILE

AMPO is an **international leader** in highly engineered valves and Integrated Smart Solutions for the most severe applications and industries as well as in stainless steel and high alloy castings. Through our AMPO SERVICE team **we guarantee a prompt response** to customer needs wherever they are throughout the world: technical support in start-up stages, equipment selection, predictive and preventive maintenance, training, etc.

Fully inhouse manufacturing process

Worldwide references

Project based on people

Innovative spirit

700+ people

In more than 60 countries

Most important partners in the industry

Cutting edge technologies

Our commitment: the best service

Customer focus

Since 1964

2. APPLICATION

AMPO POYAM VALVES offers tailored INTEGRATED SMART SOLUTIONS to fulfill severe service applications in the **oil and gas, chemical and petrochemical, mining and power industries**, where reliability and safety are both ours and our clients primary concern.

3. INTEGRATED SMART SOLUTIONS

VALVE ACTUATION CONTROL SYSTEMS

AMPO POYAM VALVES evaluates and offers a complete valve actuation control system **customized specific for your functional requirement optimizing CAPEX and OPEX**.

We are part of an integrated supply chain network with world renowned actuator manufacturers which allows us to offer the **widest range of proven-in-use VALVE ACTUATION CONTROL SYSTEM solution**s.

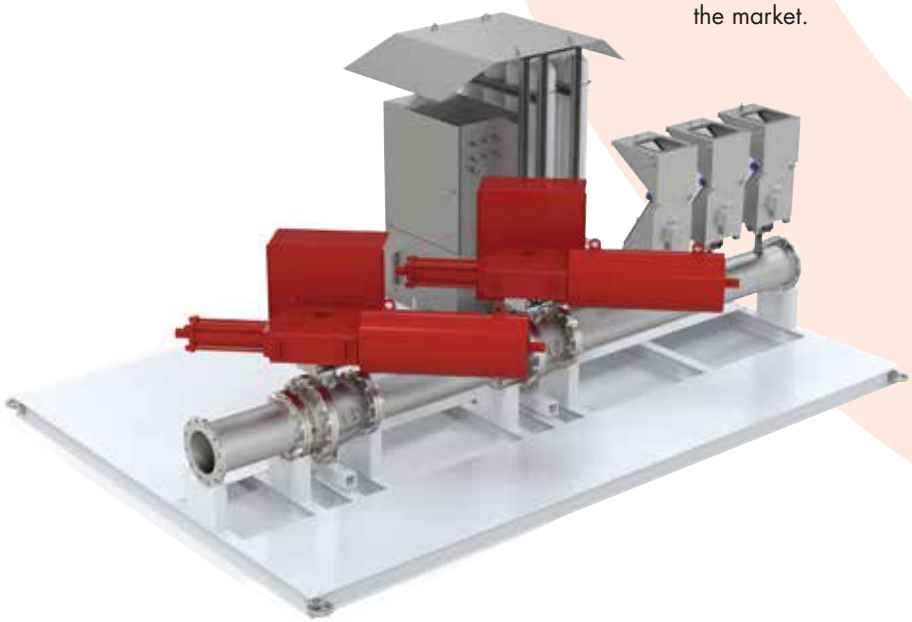
The VALVE ACTUATION CONTROL SYSTEMS go through a comprehensive Factory Acceptance Testing (FAT) to deliver the most reliable VALVE ACTUATION CONTROL SYSTEMS in the market.

SYSTEM INTEGRATION

Our valve technology expertise and integration capabilities allow us to design and develop **complete bespoke integrated systems**. With an integrated global supply chain network, AMPO POYAM VALVES can utilise any make and model of sub-systems in compliance with international governing standards and customer preferences.

AMPO POYAM VALVES designs and develops complete systems **both free standing and skid modular solutions: from simple SIL 2 ESD systems up to complex SIL 3 HIPPS and complex lift plug and switch plug valve control systems** in the severe service application of the refining industry.

After series of independent FAT the completed system goes through a comprehensive Integrated Factory Acceptance Testing (IFAT) to make sure we deliver the most reliable VALVE ACTUATION INTEGRATED SMART SOLUTIONS in the market.



Tailored smart solutions

AMPO RCM: REMOTE CONTROL VALVE MONITORING SYSTEM

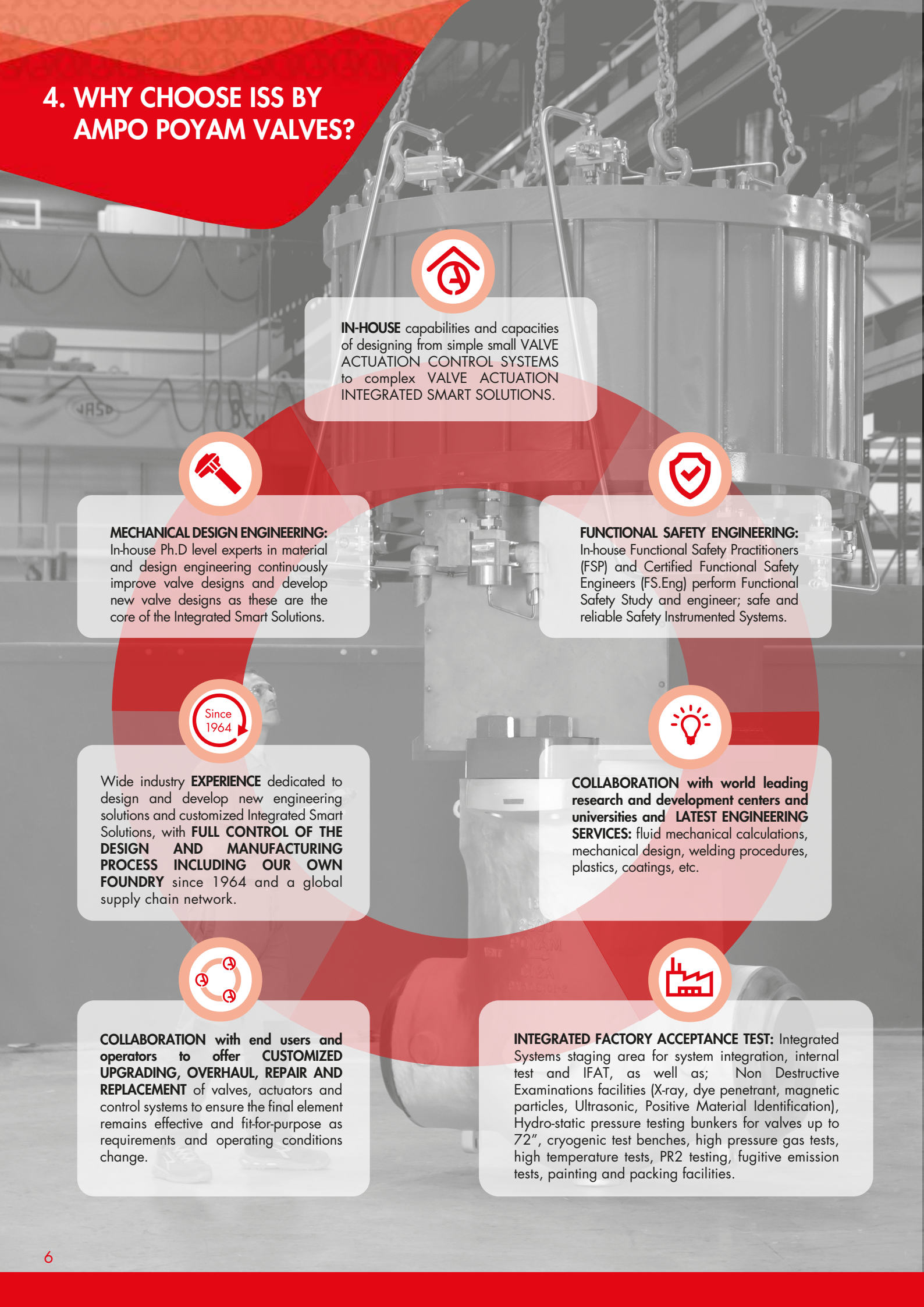
Changing maintenance operations from preventive to predictive, AMPO RCM is a **patented innovative system, developed in-house, for monitoring valves performance**. Thru a Data Acquisition System provides life cycle assurance, periodic reports (data analysis, valve state evaluation and recommended actions to operators/end users), an alarm system and supervision and diagnostic services. Design is independent from any type of actuator/manual operation system and hence can be incorporated in any make and model of valves.

All data transfers are encrypted using state of the art asymmetric key cryptography. Remote system configuration can be disabled hence it is impossible to open/close the valve remotely making the AMPO RCM compliance to cyber security requirements.

QUALIFICATIONS & CERTIFICATES:

- API 6A and API 6D
- Functional Safety Certifications for Safety Shutdown Valves
- ISO 9001 : 2008
- CE ATEX
- PED (Pressure Equipment Directive)
- IEC 61511 Stage 4: Life Cycle Design and Engineering of Safety Instrumented Systems - Functional Safety Management

4. WHY CHOOSE ISS BY AMPO POYAM VALVES?



IN-HOUSE capabilities and capacities of designing from simple small VALVE ACTUATION CONTROL SYSTEMS to complex VALVE ACTUATION INTEGRATED SMART SOLUTIONS.

MECHANICAL DESIGN ENGINEERING: In-house Ph.D level experts in material and design engineering continuously improve valve designs and develop new valve designs as these are the core of the Integrated Smart Solutions.

FUNCTIONAL SAFETY ENGINEERING: In-house Functional Safety Practitioners (FSP) and Certified Functional Safety Engineers (FS.Eng) perform Functional Safety Study and engineer; safe and reliable Safety Instrumented Systems.

Since 1964

Wide industry **EXPERIENCE** dedicated to design and develop new engineering solutions and customized Integrated Smart Solutions, with **FULL CONTROL OF THE DESIGN AND MANUFACTURING PROCESS INCLUDING OUR OWN FOUNDRY** since 1964 and a global supply chain network.

COLLABORATION with world leading research and development centers and universities and LATEST ENGINEERING SERVICES: fluid mechanical calculations, mechanical design, welding procedures, plastics, coatings, etc.

COLLABORATION with end users and operators to offer CUSTOMIZED UPGRADING, OVERHAUL, REPAIR AND REPLACEMENT of valves, actuators and control systems to ensure the final element remains effective and fit-for-purpose as requirements and operating conditions change.

INTEGRATED FACTORY ACCEPTANCE TEST: Integrated Systems staging area for system integration, internal test and IFAT, as well as; Non Destructive Examinations facilities (X-ray, dye penetrant, magnetic particles, Ultrasonic, Positive Material Identification), Hydro-static pressure testing bunkers for valves up to 72", cryogenic test benches, high pressure gas tests, high temperature tests, PR2 testing, fugitive emission tests, painting and packing facilities.

5. CASE STUDIES

5.1. VALVE ACTUATION CONTROL SYSTEMS:

SWITCH PLUG VALVE CONTROL SYSTEM:

Designed with electric control circuits with linear actuator to lift/drop and rotating actuator to rotate the obturator with panels compliant to hazardous area certifications. (ATEX, CSA, GOST…)

SAFETY FUNCTION BALL VALVE FOR CRITICAL ISOLATION APPLICATION:

Designed with electrical actuated pneumatic solenoids that will de-energize to slam shut the valve.

HIGH RATING LARGE VALVES WITH HYDRAULIC ACTUATOR CONTROL SYSTEM:

Designed with electrical actuated hydraulic solenoids that will de-energize to slam shut the valve.

CRYOGENIC TRIPLE ECCENTRIC BUTTERFLY VALVES WITH PNEUMATIC ACTUATOR:

Designed to be operated manually by handwheels and automatically by pneumatic actuators. These devices allow precise rotation of the disc to positions ranging from fully open to fully closed.

BALL VALVE WITH GAS OVER OIL ACTUATOR CONTROL SYSTEM:

Modular compact and highly reliable manifolded control systems with Hydraulic manual override to allow local open and close valve operation on loss of power gas supply. Independent valve speed control.

Y-TYPE GLOBE VALVE WITH ELECTRICAL ACTUATOR:

Besides the usual control functionality of the valve, partnering with ROTORK, this solution allows unparalleled data analysis of the condition and operational status of the valve.

SUBSEA PIPELINE ISOLATION BALL VALVE:

Subsea split body 24" ball valve with subsea gear box ROV actuator.

SUBSEA ISOLATION BALL VALVE WITH HYDRAULIC ACTUATOR:

Subsea 36" split body ball valve with hydraulic helical spline actuator.

5.2. SYSTEM INTEGRATION:

CRYOGENIC HIPPS FINAL ELEMENT FOR LNG PROJECT:

The pneumatic actuator and control system is designed with full stroke and partial stroke testing facilities.

FINAL ELEMENT FOR HIPPS PROJECT:

The pneumatic actuator and control system is designed with full stroke and partial stroke testing facilities.

TAILOR MADE SPECIAL CONTROL SYSTEMS FOR HIGH PRESSURE UNLOADING ARM:

Two valves linked, using two actuators couples, only one hydraulic cylinder. In case the arm separates, both actuators close using springs.

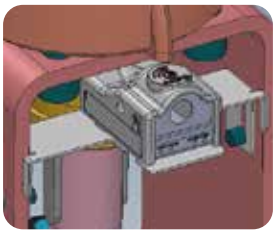
TAILOR MADE SPECIAL CONTROL SYSTEMS FOR A MINING PLANT:

The valves are slurry valves, with Shafer rotary vane actuators. A big hydraulic accumulator was provided to move the valves in case of electric power failure. The system had two pumps for redundancy.

5.3. AMPO RCM: REMOTE CONTROL VALVE MONITORING SYSTEM

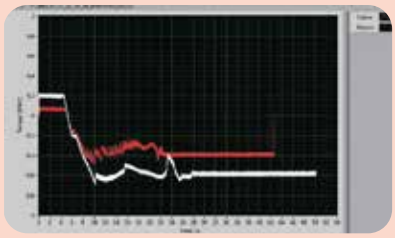
Two different coating materials were compared in an independent test laboratory in terms of their erosion behaviour.

Valve monitoring software



Monitoring device in 3D

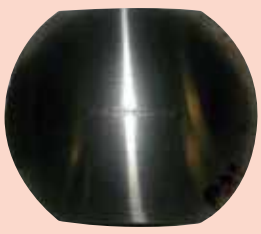
TORQUE CYCLE MONITORING:



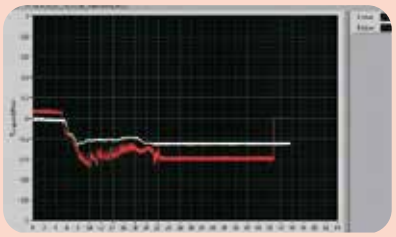
Red line:
Valve´s torque in the first cycle

White line:
Valve´s torque after 500 cycles, higher than the first cycle

Failure hypotesis: Valve´s over torque



Ball with hard coating before assembly.



Red line:
Valve´s torque in the first cycle

White line:
Valve´s torque after 500 cycles, lower than the first cycle

Failure hypotesis: Coating wear off

Ball after 1000 cycles.
Wear appears in the ball, removing the coating.

Before the first 500 cycles, the primary hypotesis was that the failure mode was over torque, where the torque value increasing was measured.
After the 500 cycles, however, torque started to decrease generating internal leakage. So finally we concluded that the failure reason was coating wear off.

The torque monitoring device can help to control the valve maintenance operational cost and help improve valve solutions.
This case study shows how important is to understand the life cycle of the valve performance in each process, not taking too premature actions and saving costs and unplanned shutdowns.

6. AMPO SERVICE

AMPO SERVICE has a wide experience in guaranteeing a **prompt response** (72 hours at site if needed) to customer needs **all over the world** with a highly experienced, customer oriented and specialized team. It provides a wide range of **ad-hoc and high added value services:**

- **MRO SERVICES**. Plug and play valves. Fast track.
- **SPARE PARTS**. Optimized Management Program. Fast track services.
- **TRAINING SERVICES**
- **FIELD ENGINEERING SERVICES (FES):** Consulting services during plant construction. Commissioning and start-up services. Planned shut-down services. Troubleshooting.
- **PREDICTIVE MAINTENANCE SERVICE:** Patented AMPO RCM system (Remote Control Valve Monitoring Service)
- **PREVENTIVE MAINTENANCE SERVICE:** Maintenance Plan developments.
- **WORLDWIDE REPAIR AND MAINTENANCE CENTERS**
- **TAILORED ENGINEERING SOLUTIONS**
- **MASTER SERVICE AGREEMENTS WITH END USERS**

Our main aim is to fufill customer needs worldwide with the following key premises: **reliability, safety, trust and efficiency.**

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