

Main Automation Contractor (MAC) Services

With extensive experience and knowledgeable resources, MAVERICK Technologies is uniquely qualified to serve as your Main Automation Contractor for large-scale process automation projects around the world. When MAVERICK serves as your MAC, we manage all your project lifecycle details—equipment, engineering services, construction and operation—to ensure completion within your budget and timeframe.

Introduction

Process control and instrumentation systems—sometimes referred to as process automation systems (PAS)— expenditures usually total up to 5 percent of an overall project budget, but improper planning, design and implementation can drive the cost up by about 25 percent of its value and can result in significant schedule extensions and downtime. The traditional approach to PAS projects often results in unplanned scope changes and inconsistencies in both design and technology selections, which reduces the owners' ability to ensure the business objectives are met, that projects are completed on time and under budget, and that the final process operates as needed. Our MAC process eliminates the barriers between various departments and OEMs to design and deliver the best-in-class PAS—significantly reducing overall project costs by streamlining project execution to provide maximum project results while minimizing risk.

MAC Structure

The following is a typical organizational solution, but is adaptable based on client requirements:

■ Program / Project Management

As your MAC, MAVERICK serves as your single point of contact to keep your project or program moving forward according to the approved budget, schedule and scope. MAVERICK's project management office (PMO) oversees the complete details of each MAC program, including coordinating OEM vendor activities and support. Our team develops a scalable solution for each client based upon the following variables:

- Size of the organization and / or locations
- Number, size and duration of projects
- Economic and financial objectives
- The client's organization functionality
- Roles and responsibilities for execution

The recommended solution leverages MAVERICK's vendor-independent status and provides common methodology across your projects / programs and automation platforms.

Prior to beginning the project, MAVERICK conducts a complete feasibility study, which includes:

- Site assessment
- Technical and industrial feasibility
- Market analysis and feasibility
- Financial feasibility and business case
- Risk assessment, investment strategy and recommendations

■ Project Controls

MAVERICK's project control function ensures that your entire global project execution team has the information they need to complete the work with a focus on quality and regulatory compliance. Working as your MAC, we utilize our quality system to monitor and control the entire process and provide a clear audit trail.

MAVERICK's third-party certified methodologies establish specific processes for achieving sustainable success. Our methods incorporate proven best practices while remaining flexible enough to accommodate the unique needs of each client. Ultimately, our Project Complete® methodology provides consistent standards for meeting critical objectives. Acting as a project framework, Project Complete ensures that all work is performed within the established scope, schedule and budget.

Our 6 Ds guide each project from concept to implementation: **Define** the objectives and gain approval; **Design** and specify appropriate integrated systems and technologies; **Develop** the programs with value-added engineering and programming; **Deploy** the solution with complete training and testing; **Direct** the appropriate talent; **Document** the process.

From beginning to end, depend on MAVERICK to execute your strategy with complete control, achieving your project and business objectives.

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MAC Structure continued

■ FEED and Detail Engineering

MAVERICK works in the front-end engineering and design (FEED) stages of your project to provide the right resources needed to work with your clients, owners and engineering, procurement and construction (EPC) firms. We select and manage the most skilled functional experts, designers and engineers to handle everything from process automation and safety to electrical and instrumentation systems, IT infrastructure and simulation.

Contracting MAVERICK to handle FEED and detail engineering work yields maximum efficiencies and cost savings over the project lifecycle. This is because upfront engineering solution development helps establish an accurate project scope and minimizes your risk and cost. We work in small, project-focused teams to provide early responsibility and rapid progression toward achieving chartered status.

MAVERICK's areas of expertise in FEED work and detail engineering include:

- Process and instrumentation control systems
- Emergency shutdown systems
- Fire and gas detection
- Advanced process control
- Creation of primary design documents, such as PFDs, equipment lists, data sheets and P&IDs, in order to yield a piping layout
- Project development to establish the project schedule, control the budget and form a cost estimate
- Team workshops to allow for idea generation and discussion of cost-reduction schemes
- Refining project dynamics through requisitioning disciplines and flagging any necessary changes in project design
- Site visits for brownfield projects, to define interfaces with existing plants
- Rigorous design calculations with safety and environmental auditing
- Interdisciplinary review and operability checks

■ Systems Integration and Programming

MAVERICK provides the programming skills needed to configure OEM skids and connect them with your facility's main control system. Then, through complete systems integration, we enable data transfer and visualization from the plant floor to the back office. Access to this real-time data is the key to making informed decisions for achieving operational excellence.

■ Procurement Support

With MAVERICK working as your MAC, we serve as your eyes and ears when communicating with your engineering, procurement and construction (EPC) firm throughout the project lifecycle. MAVERICK's support allows you to remain in control of all decision making while receiving knowledgeable, vendor-independent advice from a third-party expert. We help you select the right products and services and other solutions required to meet your project needs.

- Specification, tendering, technical and commercial review to verify that the products and services are fit for purchase
- Order placement / expediting to ensure timely delivery.
- Confirmation of plant's acceptability through mechanical work on technical bid analysis, procurement work on commercial bid analysis and quality control
- Application of confirmed vendor data to the designs for electrical and instrumentation systems, piping and foundation / structural work

■ Vendor Package Interface

As part of the definition stage of any MAC program project, MAVERICK manages the procurement and / or integration of OEM equipment and interfaces. Our technicians and engineers have extensive experience working with equipment from all the major providers in the marketplace. Our vendor-independent approach ensures that we help you find the best technologies for your needs and your existing infrastructure, and coordinate OEM activities and support. Whether you need skids for gas or air compression, water treatment, deionization or other functions, depend on MAVERICK to connect the OEM interface with your main control system to keep your operations up and running. With vast knowledge of data collection and historians, we ensure complete systems integration while helping you get the most value from your data.

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MAC Structure continued

■ Construction Support

During the construction phase of any MAC program, MAVERICK selects and supports a team of construction engineers who build your facility according to the design detail. Our construction managers juggle the schedules, materials and the workforce to achieve mechanical completion. Successful integration of the vendor design information—such as pipe fittings, foundation designs, valve dimensions and insulation details—is critical. Subcontracting work requires interpreting all design documentation, establishing site facilities and undertaking both civil construction and mechanical, electrical and instrument (ME&I) installation. Finally, our project engineers coordinate the workforce both on-site and in the office.

MAVERICK's areas of expertise in construction support include:

- Construction management
- Installation
- System commissioning—checkout and startup
- Instrument calibration
- Inspection
- Network
- Validation implementation
- Disaster recovery

■ Commissioning Support

Following the construction of a new plant, MAVERICK works to assemble and manage a team of engineers who can provide the commissioning support needed for your automation scope of work. The team first divides the new plant into process and technical systems and tests them over a designated period. During pre-commissioning, the team checks the complete installation against the design, develops operating manuals and trains the operators. The actual commissioning phase then proves system functionality by establishing safety, control and utility systems. Finally, the plant undergoes performance testing. Safety is the top priority throughout all phases.

MAVERICK's areas of expertise include:

- Management and supervision
- Installation of electrical and instrumentation systems
- System commissioning—checkout and startup
- Hot cutover
- Instrument calibration / Inspection
- Activity tracking and reporting
- Valve diagnostics
- Loop checks
- Contractor coordination
- Safety evaluation and management
- Asset management

■ Training

Training is a critical component of any large-scale global project to ensure its safety, consistency and effectiveness. Local requirements and content laws require training of local support teams in the early phases of any project. Training is also necessary to make sure that the operators know how to use the systems and to secure their long-term support.

At the beginning of every project, MAVERICK develops a project training plan to ensure that all project objectives are met at every phase of development and execution. Our internal continuing education and training department—MAVERICK University—then develops custom training modules for the project team members. The client and MAVERICK work together to define and develop the appropriate courses. MAVERICK has also developed its own curriculum for continually training additional resources to help out on future MAC projects in the chemical and petrochemical and oil and gas industries.

Subjects covered during training may include:

- Technical and quality project standards
- Local environmental, health and safety (EH&S) requirements
- DCS / PLC technology
- Industry domain knowledge

■ Safety

Because MAVERICK works in so many complex and potentially dangerous industries, we take every precaution to ensure the safety of our people and those around us. All employees participate in our EH&S program, making personal well-being the highest objective of every project.

Our staff of dedicated safety personnel manages the practical and global application of our EH&S program. This team includes a director as well as business, operations and project managers with expertise in local regulations and safety hazards. These leaders keep all employees, subcontractors and others informed of their specific roles with regards to the EH&S program. They also ensure that the right tools, safety equipment and first-aid kits are available and that everyone knows their locations and how to properly use them.

Our training programs focus on achieving zero injuries. We provide hazard awareness training as well as any necessary qualified training for performing specific types of work and using certain kinds of equipment. All worksites meet the standards and requirements of the U.S. Department of Labor Occupational Safety & Health Administration (OSHA).

Organizational Structure for Multiple Projects

MAVERICK has experience in the organization of a MAC and utilizes a project management office as the interface to the corporation and owner of metrics for success. Below is an organizational chart as an example. The proposed organization allows for focused execution within each geographic facility and even within a given location if there are multiple projects and / or initiatives. This enables leveraging, to the maximum extent possible, centralized and standardized engineering and program management processes and people. MAVERICK believes that the sharing of best practices, standards and ideas between the various projects and geographic locations provides great benefit.

