

INTRODUCTION

Marine Systems Corporation (MSC) is pleased to offer more than 34 years of exemplary experience in providing Marine Engineering and Design Support Services. MSC personnel understand the need to provide the customer with experienced, cost effective support with short lead-times. Twenty years ago MSC expanded its mission to provide design and engineering services to non-marine industries. Marine Systems is confident that it offers the **BEST VALUE** in contractor support. A brief follows to introduce you to MSC's organization and capabilities.

HISTORY, ORGANIZATION AND QUALIFICATIONS

MSC is a **Service-Disabled Veteran-Owned Small Business (SDVOSB)** Engineering firm which was incorporated in Massachusetts in September 1973. Marine Systems was originally organized to provide integrated planning, engineering, design and testing services in support of construction, repair, alteration, maintenance and logistics programs for the marine industry. Today, MSC successfully supports a wide array of private and public industries in Structural, Civil, Mechanical, Electrical, and Marine disciplines. The scope of service encompasses the following areas: Conceptual/Preliminary/Detailed Design, Engineering Analysis, Assessment of Condition, Integrated Logistic Support, Test and Evaluation, Machine Design, Computer Aided Design (CAD), Non-Destructive Testing, Shipboard Installation Support, Cost Estimating of Alterations and Repairs, Specification Development, Technical Documentation (Interactive Electronic Technical Manual (IETM)) and On-Site Technical Engineering.

Since its inception MSC has provided top quality engineering and technical services to: federal/state/city/town governments, commercial companies, the United States Navy, the Maritime Administration (MARAD), General Services Administration (GSA) and many others. The following paragraphs provide examples of Marine Systems' complex and diverse projects.

MSC provided engineering and technical support to Varian Semiconductor Equipment Associates, Inc. during the development of Ion Implanter assemblies, subassemblies and components. The passive/active fire detection system was created to determine if there was fire in the production machinery by taking air samples. If smoke was detected an alarm sounded and the system shutdown automatically in accordance with a preprogrammed procedure. If fire was detected an alarm sounded, the system shutdown and a fire fighting chemical was released into the affected equipment. MSC personnel have also created Internal Corrective Action System (ICAS) responses for issues involving: power supplies, distribution panels, harnesses, interlocks and micro switches.

For RCN Corporation MSC developed demographic maps of Massachusetts, Connecticut, Rhode Island, New Jersey, Pennsylvania and New York for strategic planning and financial decision making based on population density and cable routing costs. Marine Systems used AutoCAD file databases to develop specialized composite maps from ETAK and Census Bureau TIGER/Line databases.

Marine Systems surveyed, designed and oversaw the upgrade of an emergency flood and storm drain pumping station for the city of Revere, Massachusetts. This upgrade included the integration of a water purification system, new pumps with associated logic controls and a backup natural gas generator in the event of a power failure. To complete this task MSC provided calculations, drawings, bid specifications, vendor information and installation oversight.

For the Commonwealth of Massachusetts Department of Correction (DOC) MSC headed a three phase project to construct new sewage holding tanks and a pumping station. The company created two proposals with cost estimates. Once the DOC selected a proposal Marine Systems prepared all engineering drawings, equipment specifications and cost estimates. During the final phase of the project MSC monitored contractor construction and certified the proper operation of the system when it was completed.

Presmet Corporation contracted MSC to perform an engineering design study of its plant's primary electrical power distribution and ventilation systems. Marine Systems surveyed/documented the plant's power system, conducted tests (power consumption, harmonics, power factor, capacitor function, peak demand) and created a one line power distribution diagram. MSC also tested and balanced the ventilation system.

Marine Systems has conducted over 200 vibration and noise surveys. MSC performed a Machine Condition Analysis (MCA) of 23 pieces of rotating equipment for Quality Inspection Services, Inc. at a chemical plant in New York. Readings were taken for all three axes on pumps and motors running at several speeds and loads for performance testing purposes. The information was downloaded, analyzed and archived for future trend analysis, and repair recommendations were made to the customer.

Marine Systems was contracted by the Autoroll Company to convert its AutoCAD machinery drawings' dimensions and hardware components from English to SI (metric) units of measure. This project required extensive material research in order to source equivalent metric standard machine parts for future European sales and support.

Governo and Kavanagh Attorneys at Law contracted Marine Systems to estimate how much asbestos was installed on Bethlehem Steel Corporation Shipyard's ships built from the late 1950's to the early 1960's. MSC derived a formula and curve from available data which predicted the amount of asbestos used in a ship's construction as a function of its total shaft horsepower and tonnage.

For the U.S. Navy, Marine Systems has provided efficient, cost effective services and held more than thirty-nine (39) prime Engineering and Technical Services Contracts during the past thirty-four (34) years. MSC is the current Engineering/Design support contractor for Puget Sound Naval Shipyard Detachment Boston, which is the Expanded Planning Yard for Amphibious type ships and small craft. The company also conducts ship inspections in support of the Mid-Atlantic Regional Maintenance Center (MARMC).

Marine Systems created the plans and specifications to ensure that the MARAD fuel farm at the James River Reserve Fleet was fully operational and compliant with the state of Virginia, local fire department, U.S. Coast Guard, EPA and OSHA. These plans included: an underground oily water separator, fill/discharge piping, vehicle fill pump, water craft fuel distribution and personnel access to fuel tanks.

EXPERIENCE SUMMARY

MSC's combined corporate and personnel experience of over thirty-four (34) years has been in support of components and systems such as: Foundations, Tanks, Pressure Vessels, Propulsion (gas/steam turbines and jet engines), HVAC, Piping, Plumbing, Sewage Systems, Power, Lighting and C4I (Command, Control, Communications, Computers and Intelligence). Company personnel possess experience in: nuclear power, fossil fuel power, natural gas power, pulp and paper, oil refining, semiconductor, transportation (rail and highway), pharmaceutical and biotechnology industries.

The company is experienced in every aspect of engineering including: preparation of working drawings, studies, specifications and other design documentation and data. Marine Systems' corporate experience includes several licensed engineers and the broad range of disciplines required to support contracting such as: Program Management, Structural Engineering, Mechanical Engineering, Electrical/Electronic Engineering, Marine Engineering, Engineering Management, Computer Analysis/Programming, Technical Writing, Desktop Publishing, Quality Assurance, Logistic Support, Machinery Design and Re-Engineering to SI (metric) units. MSC's Design Engineering Support and Services include but are not limited to the following:

1. MECHANICAL ENGINEERING

- Propulsion Systems
- Auxiliary Systems
- Engineering studies and calculations
- Firemain design and calculations
- Fire Protection Systems
- Coolant Systems
- Processing/Clarification/Cleaning/Screening/Thickening Systems
- Semiconductor Manufacturing Equipment
- Complex Piping Systems design and analysis
- Heating, Ventilation and Air Conditioning (HVAC) Systems design/analysis
- Vacuum, Thermal and Pressure Sensing Systems
- Computer Aided Design (CAD)

2. ELECTRICAL ENGINEERING

- Power Generating Systems analysis and design
- Secure/Unsecure Computer Networks design
- Power Distribution Systems surveys, analysis and design
- Lighting Systems design and upgrades
- Communications and Alarm Systems design and upgrades
- Load, Voltage Drop and Fault Current analysis
- Fiber Optics
- Replace Pathfinder Radar with SPS 67 Navigation Radar
- Battery Shop design
- Computer Aided Design (CAD)

3. STRUCTURAL ENGINEERING

- Structural design, analysis and drafting
- Naval Architecture
- General Arrangements
- Engineering studies and calculations
- Finite Element Analysis (FEA)
- 3-D Modeling/Mapping
- Weight and Moment reports and calculations
- Inclining Experiments and Stability calculations
- Computer Aided Design (CAD)

4. TECHNICAL MANUALS

- Legacy Manual conversion
- New Technical Manual development
- IETM Web-Site maintenance
- IETM Technical updates
- IETM Publishing
- Gas/Steam turbines, Jet engines and support systems