INMM 31<sup>st</sup> Spent Fuel Seminar

Manufacturing Support for Spent Fuel and Nuclear Materials Management Applications

Joel Manship, Vice President Business Development

Where people make the Major difference.
Where people make the Major difference.

1458 East 19th Street | Indianapolis, IN 46218-4289 | tel 317.636.6433 | fax 317.634.9420 | MajorTool.com
Build-to-print Contract Manufacturer

- Founded in 1946
- Privately Owned
- ~330 Employees
- 600,000 sq. ft. manufacturing – environmentally controlled
- $100 million sales (annual)
- Non-Union
- Located in “Crossroads of America”
- Domestic / International customer base

World-Class Manufacturing Services

- Concurrent engineering during design / development
- Experienced Project & Program Management
- Precision Machining
  - Turning up-to 43’ in Diameter
  - 5-Axis Milling up-to 90’ continuous
- Welding & Fabrication (recognized by ASME)
  - Commercial, Pressure Vessels, Nuclear
- Finishing, Assembly & Testing
- Prototype through Production

Team Based Organization

- Customer Focused Teams (CFTs)
- Manufacturing & Continuous Improvement Teams
- Value-Added Support Teams

World-Wide Customer Base:

- Nuclear & Natl. Lab 33%
- Aerospace & Defense 26%
- Power Generation 23%
- Oil & Gas 18%

➤ Nuclear Emphasis since 2003
➤ Market Diversity Sustained and Essential
Our Campus

**Future Growth**
- ~ 130,000 sq. ft. available for development

**Plant 3**
- Small Welding (< 5ft)
- Small Machining (< 5ft)
- ~ 80,000 sq. ft.

**Plant 1**
- Administrative Offices
- Executive Management
- Engineering (CFT)
- Finance
- Sales & Marketing
- ~ 15,000 sq. ft.

**Plant 1**
- Small / Medium Milling
- Small / Medium Turning
- ~ 60,000 sq. ft.

**Building 20**
- Dedicated Programs
- Material Processing
- Shipping & Receiving
- Assembly
- ~ 165,000 sq. ft.

**Plant 4U**
- Human Resources
- Supply Chain
- Health Care Clinic
- Fitness Center
- Welding Training Center
- Machining Training Center
- ~ 110,000 sq. ft.

**Plant 2**
- Medium & Large Fabrication
- Medium & Large Machining
- Blast & Paint
- NDE
- ~ 160,000 sq. ft.

**Plant 1**
- Executive Management
- Engineering (CFT)
- Finance
- Sales & Marketing
- ~ 15,000 sq. ft.

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Market Diversity
Major Tool & Machine applies our combination of unique equipment, skilled personnel, and audited quality assurance accreditations to meet the growing demands of the nuclear industry.

Specifications and requirements for fabricating, machining, assembling and testing of nuclear hardware call for specialized manufacturing methods, equipment, facilities, and skill sets.

Our employee qualifications, facilities, and systems comply with the rigorous specifications of both nuclear customers and regulatory authorities and adhere to the most stringent quality assurance requirements in the industry.

MTM excels in the following areas:

- Spent Fuel & Nuclear Materials Packages
- Processing Equipment
- Propulsion and Power plant
- Sciences
- Research
Nuclear Fuel Cycle Expertise
the Major Difference

BTSP (cutaway)

TEF Cask

JP Package

T-3/6 CVL Independent Fuel Canisters

9977 – General Purpose Fissile Package

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the **Major** Difference

- Defense Waste Canisters
- Horizontal Emplacement Machine
- Shipping Container
- MOX Gloveboxes
- MOX Gloveboxes
- MOX Gloveboxes

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Science / Research

Spallation Neutron Source – Core Vessel

Krypton Fluorine Laser

Spallation Neutron Source – Shielded Packages

HFIR Monochromator(s)

Spallation Neutron Source – Target Cart

NCSX Fusion Reactor Vacuum Vessel
Core Competencies

“Major Tools’ depth and breadth of organic capabilities minimizes their reliance on subcontracted activities, giving me greater confidence in managing schedule and minimizing risks…”
Core Competencies

Material Processing
- Oxy Fuel & Plasma Cutting
- Sawing
- Press Brake
- Plate & Bar Rolling
- 5-Axis Laser Cutting
- Press Forming

Welding & Fabrication
- Welding & Related Processes (GMAW, FCAW, GTAW, SAW, SMAW, PAW, LBW)
- Non-Nuclear Welding (Aerospace, Military and Commercial standards)
- Nuclear Welding (N, NPT, N3, NS certifications)
- Welder Training & Development

Precision Machining
- Vertical Turning, Horizontal Turning, with Live Spindle
- Vertical 5-Axis Milling, Horizontal Milling
- Jig Boring, Tool Making
- High Speed Machining
- Machinist Training & Development

Program Management
- QA/Process Planning & Scheduling
- Material Acquisition & Execution
- Business Management Systems
- Manufacturing Systems
- Maintenance Systems

Finishing, Assembly and Testing
- On-Site Blast & Paint
- High-Temperature Cure Oven
- Helium Leak Testing & Hydrostatic Pressure Testing
- Static & Dynamic Load Testing

Quality Assurance
- Certifications
- Inspection Capabilities
- NDE Capabilities
- Audited Compliance
# Certifications

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<td>Aerospace Industry:</td>
<td>AS9100 Rev. C (Design Excluded)</td>
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<td>NB-Stamp Certification (N,N3,NS,NPT)</td>
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Quality & Continuous Improvement

Product Verification
4 – Conventional CMMs up to
  X-Axis, 320 in (8.1 m)
  Y-Axis, 100 in (2.3 m)
  Z-Axis, 72 in (1.8 m)
2 – Broken Arm CMMs (Ruggedized / Portable)
2 – Laser Trackers (Ruggedized / Portable)
Working Volumes up-to 40 ft. (12 m)

Certifications
ASNT Certified Level II & III Inspectors | Visual Testing
AWS Certified Inspectors | CWI Testing
ASNT Certified Level II & III Inspectors | Ultrasonic Testing
ASNT Certified Level III Inspectors | Penetrant Testing
ASNT Certified Level II Inspectors | Helium Leak Testing

Calibration Standards
Calibration & Traceability to NIST and other standards.
ISO 10012-1, MIL-STD-1535A, MIL-I-45208A, NSI/NCSL Z540-1, NHB 5300.4(1C)
Complete NDT & NDE Capability

- Radiography (RT)
- Magnetic Particle (MT) | Wet Fluorescent & Dry Powder
- Penetrant (PT) (Types I & II) Fluorescent & Visible Liquid
- Visual Inspection (VT & CWI)
- Ultrasonic Testing (UT)
- Helium Leak Testing
  - 5-Large Volume mechanical and turbo molecular pumps. 2-
    Varian MR 15 VS Leak Detectors
- Pressure Change Leak Testing (PCLT)
- Pneumatic Load Testing (LT)
- Large CMM & Laser Trackers

*All NDE programs are supported by ASNT certified Level III inspectors and
all in-house Level II certifications are conducted in accordance with SNT-TC-
IA and NAS41O.
Finishing, Assembly, Testing

Blast, Prime, Paint, Functional and Load Testing

Full Electro-Mechanical Assembly

Helium Leak Testing
INMM Support

- MTM has supported PATRAM and INMM events for two decades
- MTM looks to continue our support through our participation at INMM Annual Meeting and PATRAM 2016
Looking Toward Our Bright Future