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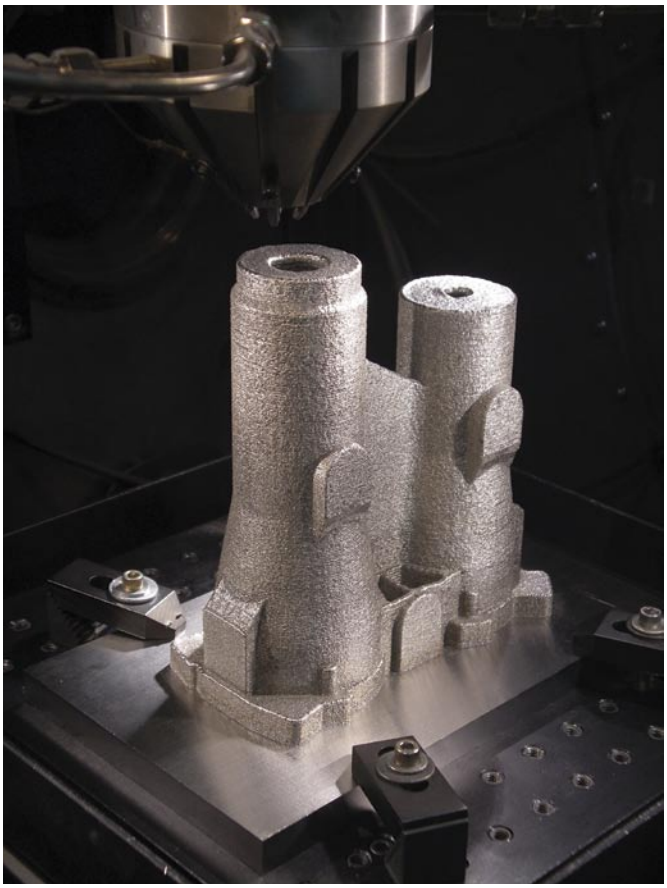
Mfg. S&T Creates Titanium Components for Space using LENS®

The Manufacturing Engineering and Process Development group recently manufactured two Ti-6%Al-4%V satellite components for the Mechanical Systems Design organization using the LENS® process. LENS (Laser Engineered Net Shaping™) is a metal fabrication process developed by Sandia that uses a laser to build up parts out of powdered metal. The near-net shape parts created are fully dense and have strength and ductility properties superior to the comparable wrought material.

The customer needed the LENS parts quickly, so several organizations within the Manufacturing Science & Technology Center teamed to complete each component within a week per component. This satellite component was the largest volume part ever made by Sandia's LENS team, measuring nearly 8" tall. Each component required 64 hours of continuous LENS operation by the LENS team, Marc Harris and David Gill, to complete. The net-shape LENS components were each immediately annealed in a single day by the Thin Film, Vacuum, and Packaging organization. Each part was then delivered to the Project and Miniature Machining organization, who utilized wire EDM to separate the component from the substrate overnight.

The total process for each LENS component took 1 week. An outside vendor also supplied a machined version of the component. The delivery time was significantly longer at 11 weeks. LENS and the Mfg. S&T Center showed its capability to quickly meet a customer's need at a competitive cost by utilizing the capabilities and expertise of several organizations within the center.

Contact: David Gill, (505-844-1524, ddgill@sandia.gov)



Ti-6%Al-4%V satellite component created by the LENS® process in less than 10% of the time required to machine a similar component from a billet

Another Chapter in the Mfg. S&T Center ISO Journey

The Mfg. S&T Center has completed another successful implementation of an International Organization for Standardization (ISO) compliant quality management system in its Electronic Fabrication (EF) functional area. The Center began planning for ISO certification for all of its business and functional areas in April of 2004. However, Phil Gallegos, owner of the Electronic Fabrication department, envisioned ISO registration long before the Center, under the leadership of Gil Herrera, began plans for an all inclusive registration. Phil chose to follow the pioneering footsteps of the Manufacturing Enterprise (ME) functional area in 2003.

The ME, the first of the Center's business units to implement an ISO quality management system, received its ISO registration under ISO 9002 in 1994. The ME has seen an order of magnitude of improvement in its products and processes, after 6 years of operating its business under the guidelines of the international standard. But of greatest importance is the change it has experienced in the ME business culture. A "Quality" culture has evolved where employees feel empowered not only to seek opportunities to improve but also to initiate the improvements. Managers are actively and continuously engaged in applying ISO meth-

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Tech Updates

Lean Manufacturing/6S comes to the Manufacturing Enterprise

The concept of Lean Manufacturing became a reality in the Manufacturing Enterprise last September when a team of individuals from across Mfg. Science and Technology performed a 6S event in Building 840. The event occurred September 13-16, 2004 in the Wire Electrical Discharge Machining (EDM) area. The 6S's are sort, straighten, shine, standardize, safety, and sustain. The goal of introducing 6S methodology to the Wire EDM operations was to establish a more effective work environment through better utilization of space, equipment and personnel.

Top: An "After" view of the Wire EDM room.
Bottom: Members from the Wire EDM Lean/6S team.

The concept was introduced to the Project and Miniature Machining organization by Tim Gardner and Margaret Sanchez, Ceramics and Glass Department, in July, 2004. Immediately, Tom Gutierrez and Clarence Esquibel saw the value of 6S for the Wire EDM area. Tim Gardner offered his support and facilitated the process of getting key personnel involved to plan, organize and perform the event. By September, a team of individuals from the Manufacturing Enterprise (ME), Ceramics and Glass Department, and the Nuclear Weapons Assessments and Communication (NWA) had been assembled. Led by Rick Sherwood, NWA, the team successfully accomplished their goal.

According to Doug Abrams, team leader in the ME, "This team was one of the most hardworking, dedicated groups that I've been privileged to work with. Over a 3-day period, they sorted, straightened, shined, and made safer the Wire EDM area. The results of this event had a significant impact on the Wire EDM operations and the owners of the area, Tom Gutierrez and Clarence Esquibel. They have nothing but praise for how this has changed their area, given them new perspective and improved their ability to be more efficient."

Subsequently, a next event was planned for the Machinist Apprenticeship area in Building 840. That event occurred on January 10-13, 2005 and was led by Ruth Bargman-Romero of the Neutron Generators Value Stream and Tom Gutierrez. This event appears to have met with similar success.

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Precision Mechanical Measurements Laboratory (PMML) Completion and Certification

The Precision Mechanical Measurements Laboratory (PMML) in Building 840 has been completed and certified for use. The PMML is the Mechanical Measurements department's most tightly controlled metrology lab environment and will help contribute to the reduction of measurement uncertainty due to uncontrolled temperature variations. These variations are one of the most significant sources of error in dimensional measurements. The room is a 928 square foot environmentally controlled lab with a 75 square foot air lock entry. The lab presently contains three Zeiss coordinate measuring machines and a precision video measuring system, and has space for two more measuring machines.

The room temperature is controlled to 20 degrees C ± 0.1 degrees C and the humidity is controlled to 35% ± 3% and meets the Class 10,000 requirement for particulate count. The air supply enters the room from the ceiling, which is a pressurized air plenum, and returns from a perimeter air return at floor level that extends around the entire base of the room. The "co-temp" return air modular wall panels are constructed with an insulated panel and a false wall, creating a controlled air barrier that completely surrounds the entire room except for the floor. This design is used for precision metrology labs around the country, including the dimensional metrology labs at the National Institute of Standards and Technology (NIST).

Lynna Esquibel and Carlos Mascarenas working in PMML

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odology in planning and improving the business. Therefore, managers are able to use facts and data to make decisions and realize a higher level of performance consistency throughout the organization. The ME is currently getting ready for their internal SNL ISO audit, scheduled for the end of January. This audit readies the ME for the external audit and recertification, planned during the third quarter of FY05.

Employees from the Electronic Fabrication department planning for an internal audit.

As Phil Gallegos watched the steady progress of the ME's ISO implementation and how it was optimizing the ME's business performance, he wanted similar successes for EF. Phil wanted to identify what was lacking in his area, fill the gaps, and move to a level of performance that would ensure success in consistently delighting customers. In the process, he recognized that an ISO Quality Management System is a business strategy, based upon a sound methodology for creating a vibrant business and keeping customers happy, while effectively balancing cost, schedule, and excellent performance.

Steps to success for Electronic Fabrication were as follows:

1. Securing buy-in from division management
2. Designatiing of motivated ISO representatives (Phil Gallegos and Shannon Delgado)
3. Training of ISO representative to learn the standard
4. Selecting of development/implementation teams
5. Securing development/implementation team buy-in
6. Securing department buy-in
7. Developing initial procedures
8. Training department employees in ISO procedures
9. Creating an internal audit team
10. Training the Audit team
11. Finalizing ISO details for projects, action steps, process owners, and implementation
12. Training process owners
13. Developing customized procedures, based upon customer requirements
14. Training department employees on entire system
15. Implementation of a completed ISO compliant system

Electronic Fabrication is currently getting ready for their internal (SNL) audit, taking place at the end of February. This audit is the final internal step toward official registration (certification), planned for the third quarter of FY05.

The Center will proceed with its other functional areas until final registration, planned for early 2006.

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New Mfg. S&T Awards Programs

In FY04 the management team for Mfg. S&T tasked a team of employees to develop an employee awards program. The two new programs for awarding employees are THanks for eXceptional Service (THXS) award and the Director's Excellence in Teaming award.

"THXS" is intended to be a "thank you" process. The Center acknowledged that we achieve success many times through the help and assistance of others. Sometimes those who receive recognition achieve a goal, or simply make it through a tough time and would like to show appreciation for those who helped them get there. A "THXS" may be given by any Mfg. S&T regular and non-regular employee to any regular and non-regular employee (inside or outside the Mfg. S&T Center) who has been helpful in going above and beyond their daily work activities in achieving a milestone. The approved nominee receives a certificate and has a choice of five items, mostly gift cards, that are non-redeemable for cash, at or close to $15 in value.

"THXS" went live in November for management and is being rolled out to all employees in February 2005. Guidance for what does and doesn't qualify as a "THXS" can be found at the Mfg. S&T internal web site at the Awards link. All nominations must be approved by the manager of the employee being nominated, unless the employee is from an organization external to Mfg. S&T, then the manager of the nominator approves the award. The management team will periodically review all awarded "THXS" to prevent abuse of the program.

The Director's Excellence in Teaming (DET) award has the objective of recognizing teams that demonstrate the ability to work together to attain outstanding results. The nomination form is easy to fill out. The DET award is a certificate and/or a team celebration luncheon not to exceed $25 per person. The following criteria must be met by applicants for a DET award:

- Nominators must be a Sandian or Sandia customer and can be a member of the team
- Teams need to be 50% Mfg. S&T personnel
- Team members may include regular, non-regular employees, and contractors (all job classifications)
- Recommended team size is 3-25 (special justification and approval required for larger teams)
- Nominated teams must be for team contributions completed within the last four months of application date
- Nominations are accepted anytime of the year and are evaluated at a minimum three times a year (every four months)

Both awards programs are administered and monitored by the Mfg. S&T Rewards and Recognition Team. Please contact any member of the team if you have questions about the awards programs or if you have suggestions. Team members include: Therese Borrego, Carla Chirigos, Bill Hughes, Jane Poppenger, David Staley, Christina Jockle-Lopez and Lou Brazee.

Contact: Carla Chirigos (505-845-8645, cdchiri@sandia.gov)

Devan Myers accepts a Lowe's Home Improvement gift card from his manager, Phil Gallegos, through the THXS award program for his excellent support in the fabrication and development of the Radar Tester subsystems.

New Employees

Lyman Chilton	14131-1
Andre Claudet	14132
Robert Grubbs	14152

Newsletter Contacts

If you have a story, or just an idea for a story, please contact one of the team members who put this newsletter together:

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