

Zone Maintenance: Better Maintenance and Better Customer Service
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Abstract

Providing maintenance service for a major university is equivalent to providing city services for a metropolitan area of much greater size. Universities are constantly building, remodeling, and upgrading in order to achieve advanced and efficient facilities that address the needs of the university community. Maintenance departments and their staff must become highly technical and explore different strategies in order to meet the ever-increasing demands placed on them.

The University of Mississippi is no different than any other major corporation in having to deal with this challenge. The challenge is to be cost effective, efficient, provide for reliability and train and retain staff to fulfill these goals.

At the University of Mississippi Physical Plant, we have taken a systematic approach to become highly technical and effective in an ever-changing campus environment. Our approach, called "Zone Maintenance," is a strategy of using multi-disciplined craftsmen to achieve these goals.

Introduction of the Organization:

The University of Mississippi, one of the oldest public institutions of higher education in the South, is a classical liberal arts institution that also offers a selection of high-quality professional programs. The historic Oxford campus provides a full range of extracurricular leadership and service opportunities, and cultural and entertainment programs in a beautiful residential environment. Ranked among the nation's Top 50 public research universities by the Lombardi Program on Measuring University Performance, the University of Mississippi emphasizes strong classroom teaching supported by excellent library, laboratory, and technical facilities.

“We Are A Great American Public University.”

Dr. Robert Khayat, Chancellor,

University of Mississippi

The University of Mississippi's main campus is located in the picturesque city of Oxford, MS. It combines the charm and safety of a small town with the sophistication of a larger city. Conveniently located 75 miles from Memphis, big-city amenities are close at hand.

Opened in 1848, Ole Miss enrolls over 17,000 students on four campuses, including the Medical Center in Jackson. Eighteen percent are minorities. The main campus in Oxford, home to the late Nobel prize-winning author, William Faulkner, continues to be an incubator for writers and literary scholars. The Center for the Study of Southern Culture and William Winter Institute for Racial Reconciliation are located here, as are twenty research centers. More than \$102 million in research is conducted annually, with world-class studies in pharmacy, physical acoustics, and

cardiovascular disease. The one million volume library is home to the most extensive Blues Archive in the nation and houses the papers of William Faulkner and James Meredith.

The Oxford campus comprises nine colleges and schools: College of Liberal Arts, School of Accountancy, School of Applied Sciences, School of Business Administration, School of Education, School of Engineering, School of Law, School of Pharmacy, and Graduate School. With 100 academic programs to choose from, students at Ole Miss are exposed to a diversity of academic disciplines that emphasize cultural breadth, intellectual depth, and independence of mind.

Ole Miss has over 4 million square feet of space spread through 200+ buildings. Our facilities are maintained by 250 Physical Plant staff equally divided between custodial services, general services, and maintenance staff.

Statement (restatement) of the Problem/Initiative

The University of Mississippi, like many other universities, had a maintenance response rooted in the sixties. Our maintenance structure was comprised of stand-alone craft shops with specialized master craftsmen. This model did not address customer service, coordination of activities, quick response, nor did it maintain the reliability of the University mechanical infrastructure.

Addressing these problems meant focusing on three areas. The first area addressed was to acquire and train competent multi-disciplined craftsmen. Second was the need to provide a

quick response and address normal routine maintenance. The last goal was to address after hour emergencies and preventive maintenance.

Design

Zone Maintenance is a highly effective approach using multidiscipline craftsmen to provide for quick response to the maintenance needs of a university campus. It maximizes the effective use of maintenance personnel.

The Zone Maintenance program is comprised of the three different units working together to provide improved maintenance service to the university community. The first component is an apprentice-training program that trains multi-disciplined craftsmen using custodians and other entry-level employees.

The second segment of the program is the “Quick Response” Zone Maintenance group, which utilizes the graduates of the apprentice program, along with other multi-disciplined craftsmen, to provide general maintenance and repair services during normal business hours. The final component of the program is the Preventive Maintenance segment which provides the regular routine inspection and preventive maintenance of the University mechanical systems. This function minimizes unplanned disruption of the University’s operations and provides emergency maintenance after normal business hours. All three units combine to form a complete maintenance program.

The apprentice-training program was developed to provide qualified, dedicated, and productive employees to the Physical Plant. Training modules were developed to deal with the “whole

person” in addition to the technical skills that would be needed to become a multi-disciplined mechanic. Examples of modules used in developing the whole person are personal hygiene, professional appearance and grooming, verbal and written communication skills, the philosophy of professional conduct and behavior, ethics, and organizational vision and mission. Technical training modules emphasize the skill trades with a weighted emphasis on electrical, plumbing, HVAC, general maintenance/repair, and renovation/remodeling. The renovation and remodeling training included carpentry and painting.

More than fifty percent of the apprentice program consists of electrical maintenance and repair skills and electrical safety training because this work area has life threatening potentials.

Examples of training in this area include electrical safety training, repair of electrical appliances and lights, repair and installation of electrical circuits, and maintenance and repair of electrical motors and motor controls.

The plumbing and HVAC (heating, ventilation, and air conditioning) modules overlap in training. They cover basic maintenance, plumbing, heating and air conditioning, natural gas supply, compressed air systems, and fire hydrant operation and maintenance. Renovation and remodeling modules include exterior and interior painting, roofing, siding, rental property turnover, floor and door repairs, and remodeling of offices or suites.

National averages indicate that a general maintenance and repair technician can handle eighty-five percent of all maintenance items. The remaining fifteen percent require the knowledge and expertise of a journeyman level craftsman. With that in mind, the Quick Response Zone group uses the multidiscipline general maintenance repair technicians to accomplish as much of the

minor maintenance as possible., thereby, allowing the journeyman level craftsmen to be more effectively used on complicated repairs.

The Zone Maintenance Group also provides an extremely powerful mission specific work force to accomplish tasks that the executive administrators need to have done quickly. An example is preparation and setup for an event that was not scheduled. This would normally require other shops to stop scheduled work. Another example is when a special request from the University administration needs immediate attention and the request does not fall into a specific maintenance category.

The Preventive Maintenance group, also known as the 'Night Zone,' has three basic missions:

1. Scheduled preventive maintenance and repairs after normal business hours
2. Emergency maintenance response and major repairs after normal business hours
3. Completion of any critical maintenance work orders that could not be finished during normal business hours.

In order to accomplish objective #1, the preventive maintenance personnel conduct routine inspections and tests, and they service equipment in a planned, time-managed program. An extensive record base is maintained that includes equipment inventories, service procedures and task files, historical records, and active maintenance schedules.

To accomplish objective #2, night zone is available to respond to any emergency maintenance need of the university community that may occur after normal business hours. Student housing has a large volume of after hour resident room calls for electrical and air conditioning. This group responds to any utility or environmental disruption of service.

The third objective, completion of maintenance work orders that could not be handled during the normal business hours, is an efficient method to extend the day crew function into the evening. Adding this third function makes the night zone have minimal idle time, and thus, makes the work unit extremely efficient and effective. Scheduled shut downs for major repair on building air conditioning and heating equipment are disruptive when started during regular business hours. The best time to handle this type of work is when the building is the least occupied, and this is usually at night or on weekends.

An active ongoing training program consisting of a minimum of forty hours per year, per mechanic, insures that all zone personnel remain fully qualified on service and repair techniques and safety. If an organization has “high tech facilities,” it’s maintenance staff must also be “high tech” and well trained in order to keep that organization functioning at its peak and to minimize unexpected disruptions of the university or it's mission.

Implementation

The Zone Maintenance program was started in the fall of 2001. We started by interviewing custodial staff that had the desire to improve themselves and become qualified for a highly technical career. Of the original twelve interviewees, only five were chosen for the original apprentice class. For the first three months, the apprentices were half-time students and half-time custodians. At four months, all the apprentices were switched to full-time students.

The apprentices' time was split between on-the-job training and classroom training. All their classes were taught by a master electrician, master plumber, master painter, and master

carpenter. The classroom experience consisted of quizzes, take-home assignments, and hands-on daily classroom simulators, and written and verbal exercises.

After the first year, apprentices took a test to graduate from being an apprentice level one. The appropriate level exam is given after completion of the program each year. The University Human Resources department gives the tests. The training instructors have provided Human Resources with 200 to 300 questions and answers for each apprentice level, from which 50 questions are selected for each level of testing. Those test questions consist of technical, safety, and procedural questions that the apprentice had covered during the previous year's training. Upon passing the test with a minimum of 80%, the apprentices were approved to move to the new pay level and the next apprentice level.

The entry pay for an apprentice level one is \$8.51 per hour, and a journeyman level maintenance mechanic pay starts at \$12.00 per hour. The apprentice pay range is divided into four equal steps. When an apprentice takes the final apprentice exam, they are at the pay level of a skilled craft maintenance mechanic.

One of the pitfalls associated with this approach has been the reluctance of custodians to take a leap of faith in enhancing their futures. Most are turned off by the educational and training requirements or by the length of time required to achieve the desired pay level. They have difficulty looking into the future when many are struggling just to survive day-to-day.

A benefit in this process was the fact that we were able to obtain three female custodians who entered into the apprentice training program. Having these ladies as a part of the program has

proven to be an asset to the Physical Plant's maintenance function. A large percentage of our customer base is women, and many women prefer speaking to a female concerning maintenance issues.

In order to enhance the educational experience upon completion of the apprentice program, a graduation ceremony is held. The ceremony with the conveying of diplomas provides a sense of accomplishment that they have earned the right to be a maintenance mechanic. Our graduates are told, "You are a professional. A professional has a diploma, and professionals hang their diplomas in their workplace."

To prove that the "quick response zone maintenance program" was viable, the first areas on campus that the philosophy was tested on were the research complexes and the main administrative building. The thought was that these are probably the toughest customers with the most demanding needs. If the program was to be successful, most of the bugs could be worked out at this level. Research areas statistically produce a higher number of work orders and generally have more mechanical equipment needs.

The expectation is that each zone technician is to walk each floor of a building, to which they are assigned, twice daily. They are required to stop at every administrative office and inquire whether or not any services are needed. This, along with the requirement of a 15-minute response to any emergency, is tough to adhere to but is doable and essential. Of all the services provided by the zone maintenance group, daily contact with the customers has been well received. It is quite common for a department that is being moved to new offices to request that their zone maintenance person move along with them to their new building. This kind of

customer loyalty was nonexistent before the zone maintenance program started.

The night zone group works from 3 p.m. to 12 a.m. This group is comprised of the best of the multi-disciplined staff. Several are master craftsmen in traditional trades. This skill level is required in order to take on any after hour emergency and preventive maintenance of critical operational and environmental equipment.

The hour of operation for this group was decided by looking at the historical data of after hour emergency calls. The 3 p.m. to 12 a.m. time slot was the most efficient period to manage the number of after hour calls.

A special uniform was decided upon for the zone staff. Blue denim shirts and khaki slacks provided a professional look that would allow the staff to go from an equipment room to an executive office and still look professional. Because of their visibility on campus, the zone group has become the image of maintenance to the public. This allows the skill trades shops to concentrate on construction, remodeling, and tasks that require a master craftsman.

It was found that the traditional shops (electrical, plumbing, carpentry, HVAC, painting), were the most resistant to implementing a program of this type. They view generalist (multi-disciplined mechanics) as being unqualified and unsafe. Our observations have shown just the opposite.

The resistance is normal in a technological evolution. Strong support from the administration is essential if this program is to be successful. After the third or fourth year, statistics show that the

service of a zone maintenance program out performed the traditional skill shop structure. Some trades such as plumbing will see a dramatic decrease in work orders, as the apprentices become proficient in general plumbing repairs. Without the need to focus on general plumbing repairs, the plumbers are now actively addressing fire hydrants, natural gas lines, meters, and renovation and remodeling.

Benefits

In this first full year of implementation, the number of work orders completed by the zone group was 4,163. By contrast, the average number of work orders completed during the previous four years was 1,711. The customer satisfaction and loyalty is extremely high. Before this program, the University was considering outsourcing. However, that is no longer on the table.

As an administrator, it is extremely comforting to have a service group that is able and willing to accept new challenges and who enjoy their jobs. For those apprentices who have gone through the program, they have acquired a living wage and the knowledge of how to be successful at technical levels unattainable before this program.

Cost savings have been realized by not having to compete with an ever-decreasing pool of skilled craftsmen. Since the apprentices were already University staff with many years of satisfactory service, there is a substantial savings by retaining employees. There is less attrition due to employee dissatisfaction. Hiring new staff and going through the entire training process again is minimized. The retained employees have increased experience and no skill sets are lost. Additional cost savings are seen by doing more tasks in-house that had been out sourced previously.