

YOUR HOSPITAL AND MEDICAL CENTER  
**CLINICAL ENGINEERING**  
**BUSINESS PLAN**

***Department History***

The current department was established in July of 1992. The transition was due to a lack of satisfaction with Third Party Company 1 and its management within the facility. Staffing before this time was a full time manager and three full time technicians. The staffing after Third Party Company 1 was reduced to three technicians only, with one acting as a lead technician.

There was very little management function at first as preparation for a JCAHO inspection in February 1993 took precedent. Two type I violations were found and corrected by June 1993. Management functions have increased since June 1993. This increase in management time currently takes up a minimum of 80% of the current lead technicians time. The department has also expanded its responsibilities in handling more equipment in-house by canceling contracts and an increased inventory due to hospital expansion, yet the department staffing has not changed in over four years. This has put a considerable strain upon the department.

Actual FTE hours available to repair and maintain equipment have decreased while equipment inventory has increased by approximately 500 pieces of equipment since 1992.

The following Business Plan is a proposal from the Clinical Engineering Department to re-engineer itself and to supply Administration the information and guidance to help make an effective decision for the facility.

## 1. ***Where/What Is Direction Of Clinical Engineering Field?***

The Clinical Engineering field has been and continues to move in the direction of operating as a business within a business. This is being accomplished by offering a total service package orientated to totally service customers needs and expanding their expectation by superior customer service. These areas will be managed by always keeping the best interests and needs of the customer as the number one priority. This direction is accomplished by offering services in the following areas, but not limited to:

### *Expanding from fix/repair to technical service/support management*

- Technology Management/Assessment
- Inservice/Education Management
- Risk Management/Assessment
- Contract Management
- Fiscal Management/Cost Containment, Reduction, Avoidance

### *Regulatory Management*

- JCAHO
- FDA-SMDA
- State (Title 22)
- AHA
- AAMI-ANSI
- NFPA
- OSHA

### *Hazardous Product Recall*

- Product Recall Management

### *Equipment Management*

- P.M.
- Repairs
- User Training

### *Vendor Management*

- Manage Outside Contracts

*Non-Clinical Systems*

- Paging System
- Nurse Call
- Security Cameras
- Collateral Damage Prevention

**2. Identify Where We Are Today**

We currently perform maintenance on following equipment but not limited to:

|                          |                       |                           |
|--------------------------|-----------------------|---------------------------|
| Defibrillators           | Anesthesia            | Incubators                |
| IV Pumps                 | Telemetry             | Feeding Pumps             |
| Ventilators              | Infant Warmers        | Electronic Scales         |
| Ultrasound Doppler       | Doppler's, Blood Flow | Solution Warmer           |
| Nerve/Muscle Stimulator  | Fetal Monitors        | Birthing Beds             |
| Exam Lamps               | Hydroculators         | ESU                       |
| Physical Therapy Equip   | MAC Lab Sys           | Whirlpools                |
| Stress Test System       | Humidifier            | Nurse Call Sys            |
| Paraffin Baths           | EKG Cart              | Traction Units            |
| Blanket Warmers          | NIBP                  | Paging System             |
| Nebulizer/Heater         | Muse Sys              | Pace Makers               |
| Laryngoscopes            | Treadmill             | Hypothermia Units         |
| O2 Gauges                | Flow Meters           | CO2 Units                 |
| Therapeutic Ultrasound   | Respirators           | Centrifuge                |
| Vital Signs Monitors     | Video Endoscopy Equip | BP Instruments            |
| Sequential Compression   | Microscopes           | Steris Sterilizers        |
| Pulse Oximeters          | Blood Warmers         | Patient Monitoring System |
| Temperature Thermometers |                       |                           |

In addition to direct repair and maintenance, we perform the following equipment management services:

- Health Device/Products Recalls Management System
- Ensure Compliance with Regulatory Agencies
- Risk Management for Medical Equipment
- Support Services Education

Product Evaluation

**3. Goal**

To provide comprehensive equipment maintenance, repairs and management services at a low cost with high customer satisfaction and to expend service on the following equipment types:

|                 |                     |                               |
|-----------------|---------------------|-------------------------------|
| Surgical Tables | Radiology Equipment | Lasers                        |
| Heart Lung      | Balloon Pump        | Cell Saver Equipment          |
| Cat Scan        | Cysto Tables        | Linear Accelerator            |
| Sterilizers     | Operation Lights    | Analytical Chemical Equipment |

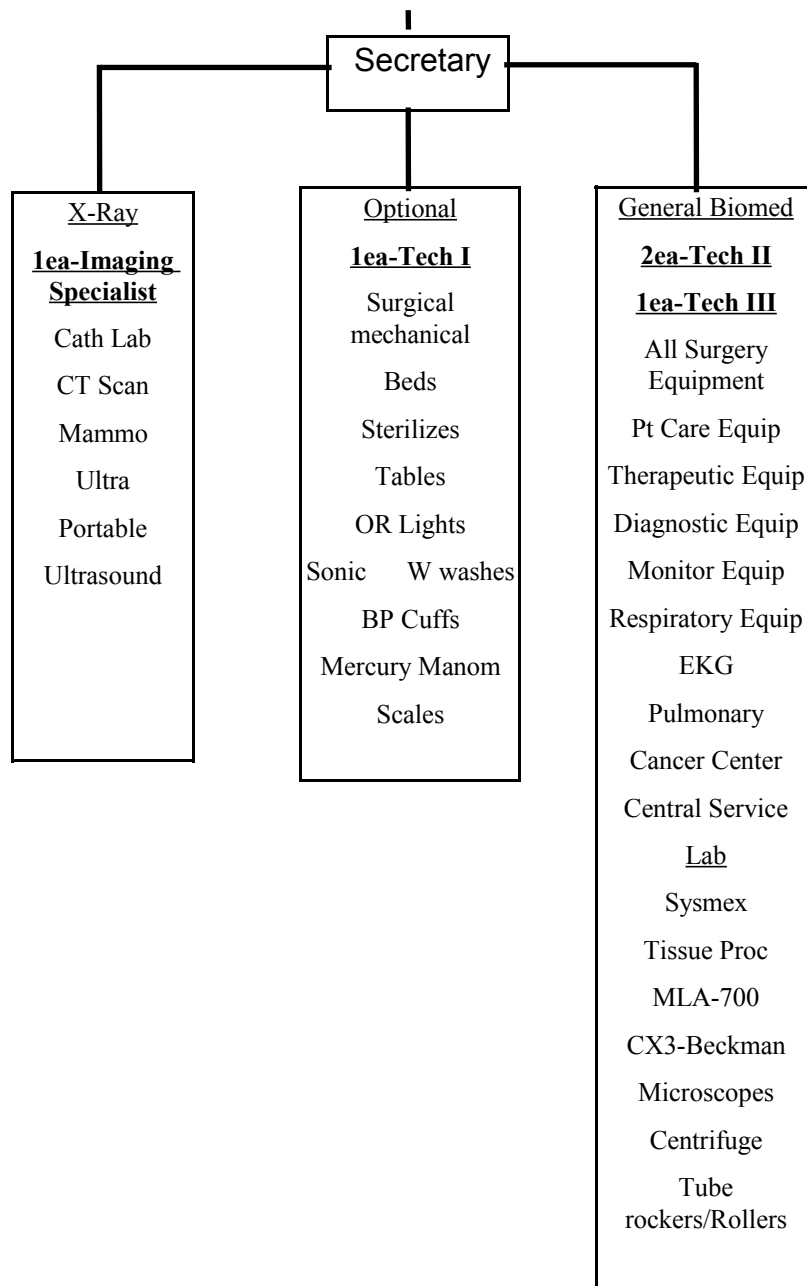
**4. How Do We Obtain our Goal?**

1. Justification to hire/staffing study/hiring
  - Cancel outside service
  - Labor hour transition from vendor to in-house staff
  - Salary determination
  - Parts inventory by canceling contracts
2. Capital Asset Management Program Partnership
  - Capping Contract - fixed cost on all Time/Material business by canceling all service contracts
3. Expand level of in-house experience by
  - Developing database of vendor repair services
  - Attending additional service schools
4. Expand Relationships within Hospital
  - Administration
  - Corporate
  - Material Management
  - Nursing
  - Information System
  - Accounting
  - Human Resources
5. Develop New Biomedical Organization Chart

**(BY YEAR 2000)**

**CLINICAL ENGINEERING PROPOSED ORGANIZATIONAL CHART**

|  |
|--|
| Director/Manager<br>of Clinical<br>Engineering |
|--|



**YOUR HOSPITAL AND HEALTH CENTER**  
**CLINICAL ENGINEERING**  
**BUSINESS PLAN**  
**S.W.O.T. ANALYSIS**

**1. STRENGTHS**

- Parts Inventory
- High Customer Approval
- Satisfaction
- Quality Improvements
- Dedication
- Communication
- High Standards
- Reliable
- Loyal
- Stability
- Vendor Relations
- No Employee Turnover In 4 1/2 Years
- Rapid Response
- Technical Experience
- Technological Knowledge
- Cost Awareness
- JCAHO Rating
- Good Internal Resources Used
- Lack Of Consultant Usage
- Self Dependent
- Regulatory Knowledge
- Safety Knowledge
- Asset Management
- Work Environment
- Good Working Relationships With Other Departments

**2. WEAKNESSES**

- Lack Of Competent Software/Hardware For Asset Management
- Lack Of Training On X-Ray And Lab Equipment
- Shop Location/Need to move upon completion of expansion, for vendors to better comply with check-in policy
- Lack Of Medical Gases And Fume Hood To Be Safe When Working On Equipment With Biomed Dept.
- Lack Of Medical Maintenance Accounting System (62 Sub Account Or Similar Device)
- Need More Involvement In Helping Hospital Plan For Future

- 50/50 For Lead Tech Is Non-Existent, Puts More Work On Hess, Steve

- Lack Of Understanding By Administrator/Director/Managers Of P/P's In E.O.C. Manual. Inservicing Training Of Policies/Procedures Would Help Alleviate Misunderstandings

### 3. OPPORTUNITIES - Internal

- X-Ray
- Surgery
- Blood Pumps
- Balloon Pumps
- Ultrasound

- Lab
- Heart/Lung
- Cell Savers
- Linear Accelerators
- Cath Lab

### 4. OPPORTUNITIES - External

- Physician offices
- Clinics

- Corporate Biomed Structure
- Urgent Care Facilities

### 5. THREATS

- 3rd Party Service
- Organizations - THIRD PARTY COMPANY 2, Third Party Company 1, THIRD PARTY COMPANY 3, OEM Service, Third Party Company 4

- Independent Service Organizations

## **NEEDS ANALYSIS**

Labor hour standards for Clinical Engineering are typically two hours per piece of equipment per technician per year. The typical Clinical Engineering technician will perform maintenance 70% of his/her time based on 2080 hours per year. The other 30% is vacation, sick time off, training, and in-house administrative duties. This calculates to 1456 hours spent maintaining equipment per technician per year.

Currently we have approximately 1900 pieces of equipment on inventory plus also maintain the nurse call system, blood pressure cuffs, electronic thermometers, wall suction units, and flow meters. These are all non-inventory controlled items. This projects out to approximately 4100 labor hours per year.

Current staffing would show available hours to perform maintenance at 3200 hours, short fall of 900 hours. An additional 400 hours of labor time would be utilized to perform maintenance on Radiology and Ultrasound Equipment (see figures in projected financial break down in next section). There will also be an increase in man hours needed by approximately 100 hours with the expansion of Women's Services and the new ICU. This brings the total to approximately 1400 hours. This technician would be needed by the first of February of 1997 to assist in the moves of the Women's Center and ICU.



## THIS YEAR'S PROPOSAL

### **Staffing/Salaries**

Hire new FTE to handle basic Radiology/Ultrasound and general Biomedical Equipment. Salary range would be between \$40,000 to \$70,000 depending on experience. Creation of managers/supervisors position, salary between \$50,000 - \$60,000. Create technician III, position salary between \$40,000 - \$45,000. Total salaries not to exceed \$265,000.

### **Maintenance Costs**

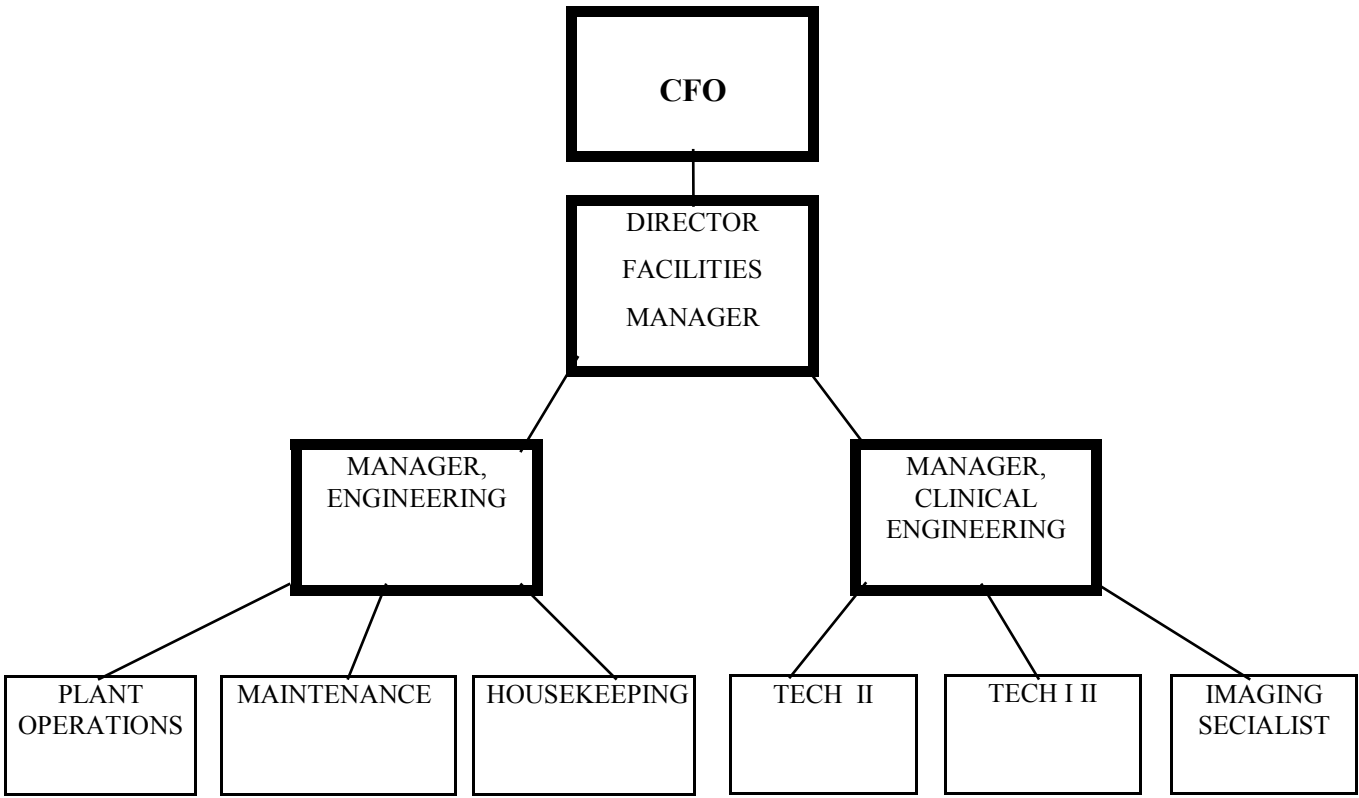
We recommend that a capping contract be utilized to assist us in moving to perform in-house maintenance on diagnostic Radiology and Ultrasound equipment. This contract will enable us to cancel or let expire all our service contracts and have maintenance performed on a time and materials basis. All invoicing will be paid directly by this company. They will reimburse the facility on work performed by the Clinical Engineering Department. This would allow us to hire a qualified technician as stated in "Staffing/Salaries" and gradually assume responsibility for the maintenance in-house while acquiring experience and customer confidence. We believe this a better alternative to self insurance since time and materials is a very high risk on Radiology and Ultrasound equipment (see attached financial figures) time and materials costs can fluctuate up or down by as much as 30%.

The second benefit is that all maintenance costs are then located in one budget and managed by Clinical Engineering and the company chose to cap our costs.

The third benefit is that this company will assist in training costs by supplying \$5,000 in a training pool to further educate the department.

**Training Costs:** Training costs increase by \$15,000 to obtain training on Cath Lab systems for imaging specialist over current costs.

**THIS YEAR'S  
ORGANIZATIONAL CHART**





## **NEXT YEAR'S PROPOSAL**

### **Staffing/Salaries**

New FTE to absorb workload from new NICU and expansion by imaging specialist into linear accelerators. Additional 500 hours - 150 in NICU and 350 in the Cancer Center. Imaging specialist now at 1200 - 1300 hours, possibly could also handle all film processor maintenance in-house. New FTE projected hours at approximately 1200-1300 hours also. Position would be Biomed Technician II. Salary/Benefits \$50,000-\$60,000.

### **Maintenance Costs**

No changes

### **Training Costs**

Stay the same. Schools for Linear Accelerators and Biomed schools to help cancel contracts.

## **SUMMARY OF PROPOSALS**

The Clinical Engineering Department is a multifaceted, multi-talented group. Dedicated to providing a safe environment with high customer service for a low cost.

The main weakness we have is our lack of a good software management system. The lack of a competent software management tool does not allow access to information on a timely basis. The current system from Third Party Company 1 is slow and is DOS based. A windows based system would save time and allow data to be entered faster. A windows based system would also allow a better database and better database management.

Our main strengths are our loyalty, technical ability and desire to take on new challenges. This has been evident in our obtaining schooling on ventilators and anesthesia and providing maintenance on these devices in-house. Few hospitals do this.

Cost of maintaining equipment will increase dramatically over the next five years as devices become more sophisticated. Our approach of obtaining training and maintaining these devices in-house will save this hospital between \$550,000 - \$750,000 over the next five years. (see attached cost summary)

Our recommendation is to utilize a capping contract to cap maintenance costs and to increase our staffing by hiring a Radiology specialist to perform maintenance on our Radiology equipment. The capping contract puts all maintenance costs in one budget while the Radiology tech allows in-house maintenance and a decrease in down time waiting for vendors and increased utilization of equipment.

We feel, in closing, that we are the facilities consultants on medical equipment. We offer a well rounded experienced department capable of supporting this hospital virtually free from outside services.