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EL CONTROL DEL EDIFICIO EN EL HOSPITAL AMBROISE PARE

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El Hospital Ambroise Paré, situado en el sur de Hainaut, Bélgica, es el establecimiento público más grande de la región Mons - Borinage. Implantado sobre dos sitios de 30.000 y 10.000 metros cuadrados está conformado por 540 camas repartidas de la siguiente manera:

355 camas de agudos
90 camas de recuperación
96 camas de reposo y cuidado

QUIEN ES AMBROISE PARE?

Ambroise Paré es una de las personalidades que marcan el Renacimiento en Europa.

Padre de la cirugía moderna, a él se debe el abandono de la cauterización de llagas con aceite en ebullición, durante la guerra, y la ligadura de arterias.

Su espiritu innovador e independiente pone en duda y cuestiona los principios antiguos. El vivió algún tiempo en la región de Mons habiendo atendido tanto a los notables de la ciudad como a los menos favorecidos por la fortuna.

Su lema "LABOR IMPROBUS OMNIA VINCIT", es para estimular a todos los que trabajan en el Hospital.

MISION DE LOS RESPONSABLES TECNICOS DE UN HOSPITAL

La misión de los responsables de los servicios técnicos se articula alrededor de dos funciones diferentes pero estrechamente ligadas.

Se trata en primer lugar de lo que llamaremos Departamento "Edificio".

Este Departamento se ocupa esencialmente, del mantenimiento de los edificios, de la transformación y renovación de los locales y de la puesta al día de los planos de arquitectura.

En segundo lugar deberá existir el Departamento de "Técnicas Especiales".

Un buen mantenimiento y un estricto control de las técnicas especiales perseguirá tres objetivos:

- El confort del paciente y del personal
- La economía de energía
- La seguridad

QUE SON LAS TECNICAS ESPECIALES

El Hospital Ambroise Paré posee:

* 3 hornos de los cuales dos funcionan con fuel oil y 1 con gas.
* 7 calderas que pueden producir más de 11 millones de Kca.
* Más de 50 llaves de regulación.
* La producción de agua caliente sanitaria.
* 4 productores de agua refrigerada que sirven al sistema de aire acondicionado.
* Cámaras frigoríficas y congeladores.
* La campana de la chimenea y material de cocina.
* 5 cabinas de alta tensión alimentada con 10.500 volts.
* 9 transformadores que pueden suministrar 3.000.000 de watts.
* Más de 100 tableros seccionales.
* 3 equipos electrógenos capaces de suministrar instantáneamente 700.000 watts.
* Producción de aire comprimido.
* Generadores de vacío.
* Distribución de fluídos médicos.
* Sistema de detección de incendio de tipo visible (más de 3.000 locales).
* Protección de incendio (extinción automática).
* 2 centrales telefónicas unidas por red, que permiten una transferencia total de comunicaciones entre los dos sitios de Mons y de Havré.
* Busca-personas funcionando sobre los mismos principios que la telefonía.
* Los ascensores y montacargas.
* Etc.

Algunas cifras de consumos permiten evaluar la importancia de las instalaciones técnicas del Hospital:

At present there are many existing situations in which nobody has questioned the safety of the electromedical equipment.
For this reason, we'd like to illustrate a detailed analysis concerning the safety of about 7000 parts of electric equipment (in particular: equipment from operating rooms, reanimation rooms, intensive therapy, ambulatories, etc.) functioning in eight hospital units in the region Emilia Romagna.
The equipment has been tested according to CEI norms and we have noticed, from the statistics that have been calculated, that the percentage of equipment that doesn't follow the prescribed norms is more or less the same in the small as well as in the large hospital unit (hospitals with 250 beds and hospitals with 1400 beds).

SAFETY CONTROLS	
- Equipment conforming to prescribed standards	4751
- Equipment not in the norm but modifiable within the accepted norms	1981
- Dangerous equipment, immediately declared out of order	114

First Unit
Equipment conforming to: 258 (64,5%)
Equipment not complying but liable to modification 130 (32,5 %)
Equipment out of order (not modifiable, dangerous) 12 (3 %)

Second Unit
Equipment conforming to: 328 (65,6 %)
Equipment not complying but liable to modification 162 (32,4 %)
Equipment out of order (not modifiable, dangerous) 10 (2 %)

Third Unit
Equipment conforming to: 203 (67,7 %)
Equipment not complying but liable to modification 91 (30,3 %)
Equipment out of order (not modifiable, dangerous) 6 (2 %)

Fourth Unit
Equipment conforming to: 169 (67,6 %)
Equipment not complying but liable to modification 77 (30,8 %)
Equipment out of order (not modifiable, dangerous) 4 (1,6 %)

Fifth Unit
Equipment conforming to: 210 (70 %)
Equipment not complying but liable to modification 87 (29 %)
Equipment out of order (not modifiable, dangerous) 3 (1 %)

Sixth Unit
Equipment conforming to: 65 (65 %)
Equipment not complying but liable to modification 34 (34 %)
Equipment out of order (not modifiable, dangerous) 1 (1 %)

Seventh Unit
Equipment conforming to: 2499 (59,4 %)
Equipment not complying but liable to modification 950 (27,1 %)
Equipment out of order (not modifiable, dangerous) 47 (13 %)

Eighth Unit
Equipment conforming to: 1019 (67,9 %)
Equipment not complying but liable to modification 450 (30 %)
Equipment out of order (not modifiable, dangerous) 31 (2,1 %)

Types of irregularities

Another analysis followed to evidence the type of irregularity detected in the various equipment such as:

A= lack of earthing

B= problem on the plug, supply cable, fairlead (plug not up to standards and dangerous, supply cablepeeled, dangerous, uncovered wires, chock missing with the consequence of slits in the rubber of the cable).

C= fuse or fuses missing

D= mechanical imperfections in the structure (danger of falling upside down, parts coming off, unprotected moving parts, ecc).

E= switch missing or monopolar switch instead of required bipolar one (two phasesare used).

F= high resistance of the feeding cable (over 0,1 or 0,2)

G= problems of various nature (pedals not in the norm, high frequency currents, exceedingly low defibrillation energy, compulsory alarms missing or out of order, inefficient batteries, etc.).

H= high leakage

Quite a few of the examined parts showed one or more of the afore mentioned inconveniences.

	A	B	C	D	E	F	G	H
First Hospital	16	40	71	2	32	15	14	4
Second Hospital	20	51	89	3	40	19	18	6
Third Hospital	11	28	50	2	23	10	11	4
Fourth Hospital	10	24	43	1	19	9	8	3
Fifth Hospital	13	20	40	3	28	15	8	2
Sixth Hospital	4	12	20	0	9	5	4	2
Seventh Hospital	122	320	500	10	230	120	100	30
Eighth Hospital	60	135	280	15	122	61	45	15

The statistics, deriving from an analysis of the technology present in eight hospital units, show immediately that the situation of the equipment presently in use is not acceptable for its low levels of safety measures and therefore in these cases a thorough control that will evaluate the "safety levels" is rendered absolutely necessary.

We must underline the fact that we have found 2095 equipment parts defective, of which 1981 were brought to acceptable safety standards, whereas 114 were considered out of order because they were not modifiable.
To the above figures we can add another significant number 3% of the newly acquired equipment does not qualify according to legal norms.
This percentage is, however decreasing, and more recent percentages show a keener concern with the problem of safety by the producers and manufacturers.

EVALUATION
Efficiency
Safety
Costs
Maintenance

1.4 Conclusion

The organization must rely on a system of information that will allow the analysis and evaluation of its efficiency.
It must be provided with the instructions for its use, the safety measures necessary to manage the need to buy new technology and to substitute its parts.
This means that the buyer must be able to reason about economic matters, such as: up-dating the price of each single piece of equipment, the redemption plan to amortize the equipment, the prices and values of reeding the leases goods or those that have been bought on hire
Other important managerial elements are: programming the maintenance calendar, keeping track of guarantee deadlines, safety standards etc.
In order to obtain useful economic data for our purchases we can rely on a "price observatory" with standard maintenance contracts.
For more costly equipment we can consider its full potential and use, the costs of its management and the impact it can have on the organization as a whole and on its prospective operators.

BIOMEDICAL TECHNOLOGY COORDINATION AND CONTROL		
External Service (with Suppliers)	HOSPITAL REQUEST	Inside Service

Therefore, it seems clear that the main concept to develop for a safe management is the need to employ highly qualified personnel, professionally prepared for its job.

In this case we must favour a "pool" of professionally able workers who will be able to manage such an important organization.
This "pool" must function like a hinge or, like in other nations, the so.called technical interpreter highly specialized in its field that knows how to make technology function at its best.

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Dr. Ing. Zavarini Paolo Responsabile del Settore di Ingegneria Clinica dell'Ospedale di Ferrara Italy; da oltre venti anni sta lavorando nell'Ospedale sulla gestione delle apparecchiature elettromedicali.
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His principle concerns focus on maintenance and safety to equipment and hospital wards, dedicating much of his time to the study of biomedical technologies being a member of the clinical commission of the Emilia Romagna Region.