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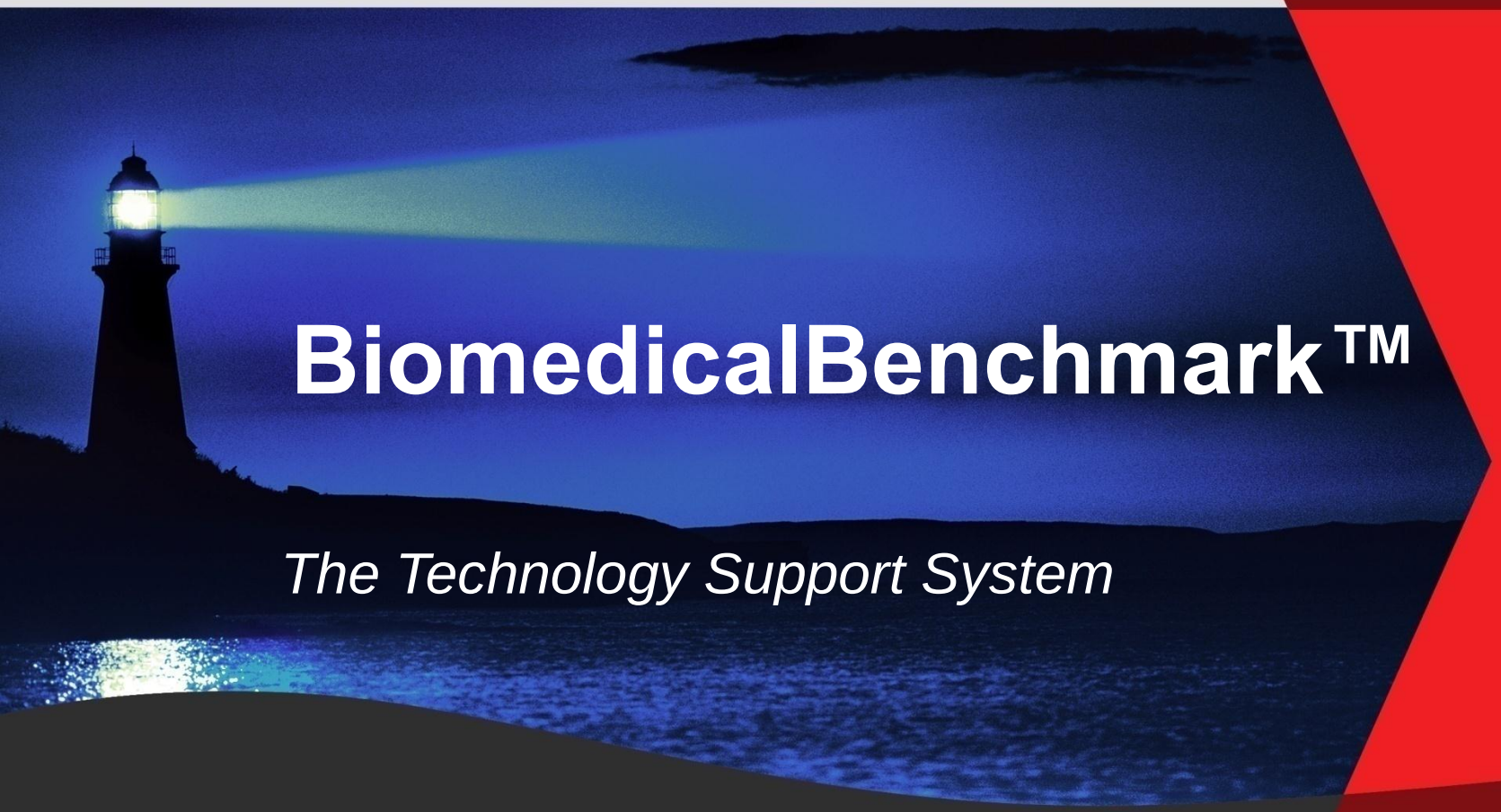

BiomedicalBenchmark™

The Technology Support System

What is BiomedicalBenchmark?

A comprehensive, unique Web-based system to assist with assessing and improving the efficiency of your equipment management activities.

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THE TECHNOLOGY SUPPORT SYSTEM

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Why use BiomedicalBenchmark?

- It provides the means to benchmark your activities against a large number of other clinical engineering departments
- It gives you access to over 80 tried and tested inspection and preventive maintenance procedures
- All content is provided either from data submitted regularly by clinical engineers world-wide or from ECRI Institute's decades of experience

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What are the advantages of using BiomedicalBenchmark?

- It provides a “one-stop shop” for your benchmarking and PM procedure needs
- Procedures can be fully customised to suit individual requirements
- It is entirely Web-based – no software to install
- It is constantly evolving and continually updated

What is in BiomedicalBenchmark?

- ECRI Institute Data
  - Equipment Risk levels, PM Frequencies, Service Cost v. Acquisition Cost
- User Contributed Data
  - Maintenance Data, Demographic Data, Users' PM Procedures
- Procedures & Guidance
  - Customisable PM Procedures & Forms, Guidance Articles

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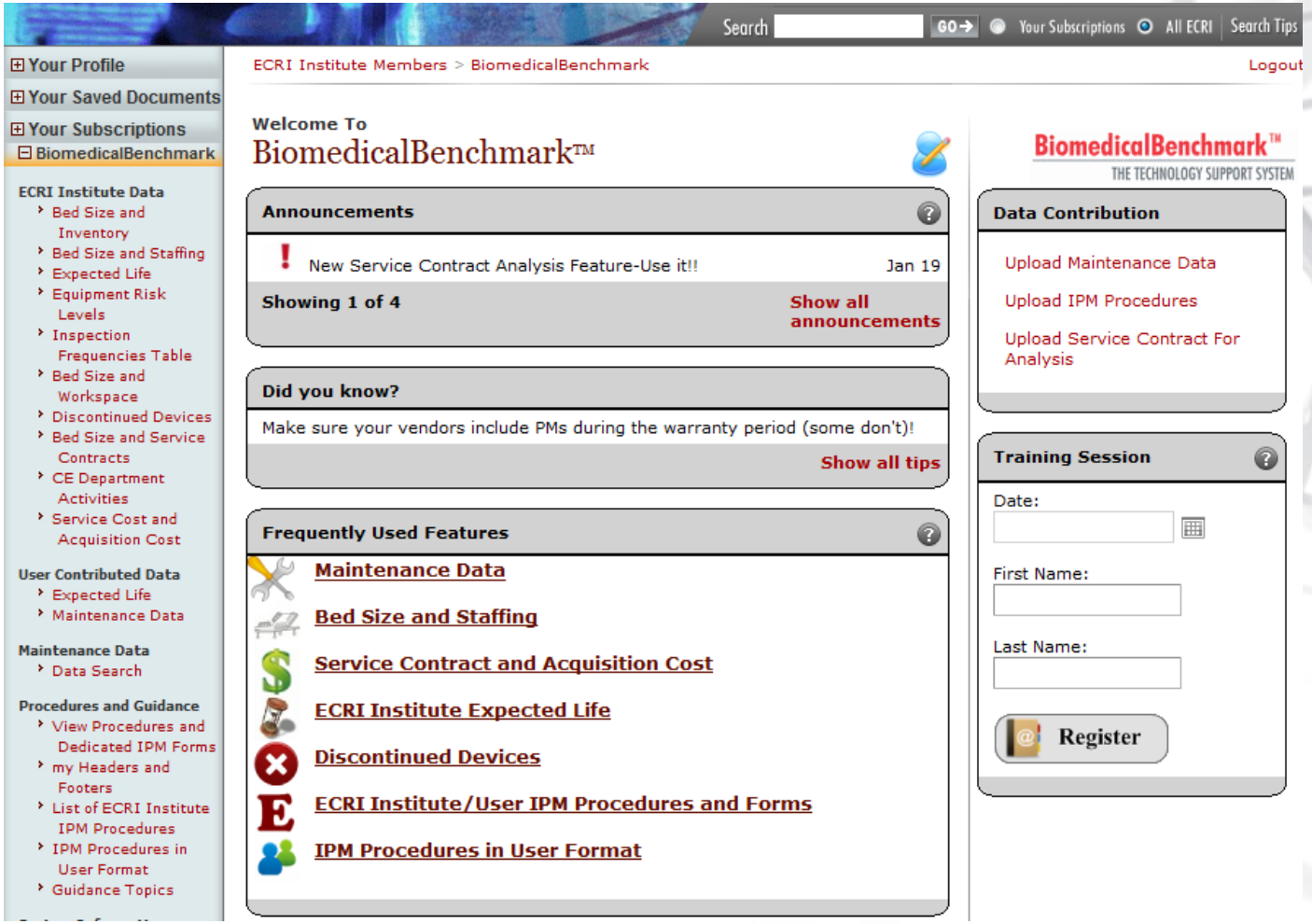
Home Page



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Content - Expected Equipment Life

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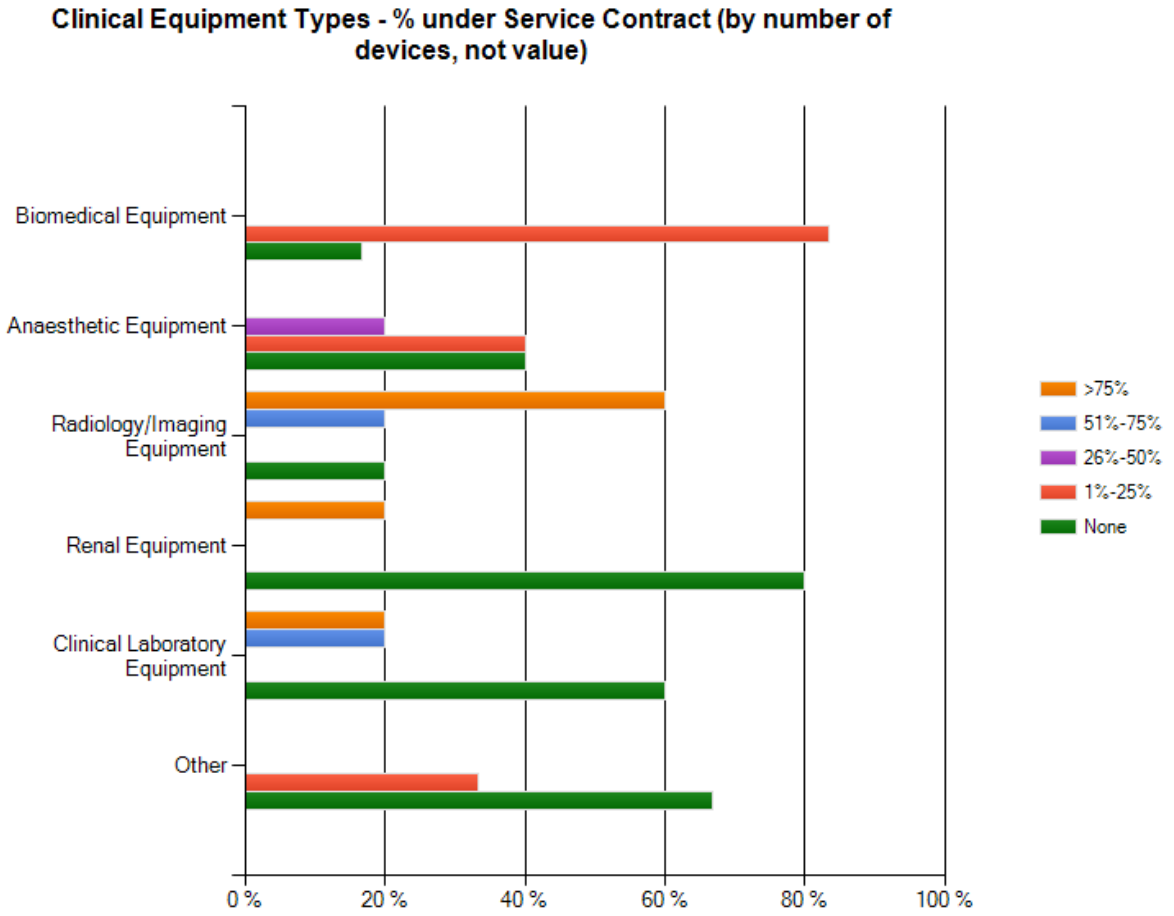
Device Description Universal Medical Device Nomenclature™	UMDNS™ Codes	Expected Life Years
Stimulators, Electrical, Peripheral Nerve, Analgesic, Transcutaneous	13-782	8
Stretchers, Mobile, Hospital	19-021	10
Surgical Facility Booms, Ceiling-Mounted	16-001	10+
Surgical Helmet Systems	11-995	7
Tables, Operating; Orthopedic	13-961	10 to 12
Temperature Monitors, Electronic, Patient	14-034	7
Thermometers, Electronic, Infrared	17-887	7
Thermometers, Electronic, Thermistor/Thermocouple, Patient	14-035	5
Thyroid Uptake Systems	16-567	10
Tissue Processors	15-190	10 to 12
Ultrasonic Cleaning Systems	14-263	8 to 10
Ultrasound Units, Physical Therapy; Ultrasound Units/Neuromuscular Stimulators, Physical Therapy	11-248	8
Urine Analyzers; Refractometers	18-634	5 to 7
Urodynamic Measurement Systems	14-307	7
Ventilators, Intensive Care	18-792	8
Ventilators, Intensive Care, Neonatal/Pediatric	14-361	8
Ventilators, Portable	17-423	8
Ventilators, Transport	18-098	8

Content - Maintenance/Reliability Data

Device type	UMDNS	Manufacturer	MODEL	Number of Devices	Avg Age Yrs	IPM Interval (years)	Hrs/PM	Repairs per Device	Hours/Repair
Defibrillator/Monitors, Batt.	11129	Corp	ACLS-M	75	6.5	0.5	1.68	0.29	1.57
Defibrillator/Monitors, Batt.	11129	Physio-Control	LIFEPAK 12	69	4.9	0.5	1.20	0.17	0.94
Defibrillator/Monitors, Batt.	11129	Physio-Control	LIFEPAK 20	27	1.5	0.5	0.92	0.11	1.00
EEG Monitors	12602	Sys.	A-2000	22	4.1	1	0.79	0.05	2.00
Electrocardiographs, Inte	16231	Marquette	MAC5000	36	6.5	AsNeeded		0.44	2.35
Electrocardiographs, Inte	16231	Marquette	MAC5500	27	1.3	AsNeeded	2.00	0.67	1.56
Electrocardiographs, Mult	11411	Marquette	MAC 8	9	11.7	AsNeeded		0.00	
Electrocardiographs, Mult	11411	Marquette	MAC PC	2	20.3	AsNeeded		0.50	1.50
Electrocardiographs, Mult	11411	Marquette	MAC 6	19	15.6	AsNeeded	1.00	0.00	
Electrocardiographs, Mult	11411	Marquette	MAC 12	4	22.1	AsNeeded		0.00	

Content – Demographic Data



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Content - IPM Procedures

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Search Procedures/Content: in All Search

ECRI Institute Procedures | User Procedures | Dedicated IPM Forms

Procedure Title	Status	Acceptance	Major	Minor	Created On
Electric Beds	Final	✓	✓		10/15/08
Electrical Receptacles	Final	✓	✓		10/15/08
Electrocardiographs	Final	✓	✓		10/15/08
Electrosurgical Units	Final	✓	✓		10/15/08
Fetal Monitors	Final	✓	✓		10/15/08
Frequency-Doubled Nd-YAG Surgical Lasers	Final	✓	✓	✓	10/15/08
General Devices - IEC Version	Final	✓	✓		10/15/08
General Devices - U.S. Version	Final	✓	✓		10/15/08
General-Purpose Infusion Pumps	Final	✓	✓		10/15/08
Heart-Lung Bypass Units	Final	✓	✓		10/15/08

1 2 3 4 5 6 7 8 9 Page size: 10 84 items in 9 pages

Content – Customised IPM Procedure

Demo NHS Trust

CLINICAL ENGINEERING DEPARTMENT

Anaesthesia Vaporisers

Procedure No. 1553-20100126-01 (Minor)

Used For:

Commonly Used In:
Operating theatres, A&E departments, delivery rooms, ambulatory surgical centres, and any area the administration of an inhalation agent (with anaesthesia units)

Scope:
Applies to the various anaesthesia vaporisers used to deliver a known concentration of vaporised anaesthetic

Risk Level: High

Type	Interval	Time Required
Major	6 Months	0 hours
Minor	0 NA	0 hours

Overview:
An anaesthesia unit vaporiser is used to vapourise a liquid anaesthetic agent and deliver a controlled amount to the patient.
Anaesthetic agent vaporisers are required to be concentration calibrated (i.e., a calibrated knob controls the output concentration). Older vaporisers that do not have a single control for selecting anaesthetic vapour concentration should be removed from service. there are two types of concentration-calibrated vaporisers: variable bypass and heated blender.

Concentration Check.

Record the type and control number of each vaporiser. B
anaesthetic analysers, follow the manufacturer's procedu
Vaporisers should usually be tested with an oxygen flow
readings of some vapour analysers). Test the vaporisers a
the normal clinical use range (e.g., 0.5%, 1.0%, and 3.0%
1.0% for halothane, 10% for desflurane), test the vaporis
should be ±0.3% vapour or ±10% of the selected value, v
observed, allow the vaporiser to operate for a minute or t
short stabilisation period.]

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Content – Customised IPM Forms

Demo NHS Trust

CLINICAL ENGINEERING DEPARTMENT

STATUS: ☒Passed ☐Service Required ☐Preventable problem ☐Adverse event likely

Anaesthesia Vaporisers

Procedure No. 1553-20100126-01 (Major)

Facility: District General Hospital	**Dept:** Theatres	
WO No.: 457832	**Date:** 04/01/10	**Inspector:** J Smith
Mfr: Penlon	**Model:** V15KS-ENEZ	**SN:** D0105-345
CTRL No: 4591	**Loc:** Theatre A	**IPM Time:**

SPECIAL PRECAUTIONS

Do not fill a vaporiser with an inhalation agent unless you are qualified to do so. Always use a scavenging system or appropriate ventilation when inspecting vaporisers. For personal safety, when inspecting vaporisers alone, notify other personnel of your location. Be sure that filler ports are tightly capped before passing gas through the vaporiser.
As a general precaution, older vaporisers containing an anaesthetic agent should not be tipped. If such tipping occurs, notify the user and follow the manufacturer's recommended procedures for airing or drying the vaporiser.

TEST APPARATUS

	Control/Serial No.
Halogenated anaesthetics analyser	3276
Electrical safety tester (mains-powered vaporisers)	2291

QUALITATIVE TASKS

Pass	Fail	
☒	☐	Chassis/Housing
☒	☐	Mains Plug/Receptacles
☒	☐	Strain Reliefs
☒	☐	Fittings/Connectors

Content - Guidance Topics

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Benchmarking – an Overview

Benchmarking is a process that helps a manager to discover where to focus attention to improve business practices. It requires a measure (indicator) of each practice and a reference value for the indicator (a benchmark). Managers will usually focus their attention on practices that deviate the most from their benchmarks. This guidance topic article describes benchmarking and its benefits in more detail and also how BiomedicalBenchmark™ can be used to improve delivery of clinical engineering (CE) services.

A simple benchmarking example

Inspection completion rate (frequently referred to as "PM completion rate") is an example of an indicator that compares the number of inspections completed to the number of inspections scheduled for a given period — typically one month.

$$\text{Inspection completion rate} = \frac{\#\text{ inspections completed in one month}}{\#\text{ inspections scheduled for that month}} \times 100\%$$

Definitions

- Indicator (also called a metric): A number used to measure a process or level of performance. In addition to inspection completion rate, other significant CE activities that can be compared include:
  - Annual service cost per device
  - Average response time
  - Average inspection and repair times per device
  - Annual budget for training per technician

  Indicators can also characterize equipment performance
  - Failure rate
  - Downtime
  - Average battery life

- Benchmark: A reference value for an indicator[1]

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Content - Guidance Topics

Support assessment

Qualitative versus quantitative assessment

Although not required by the Joint Commission, quantitative assessment methods are used by some healthcare facilities. They have developed a numerical grading system to determine whether and how often a device should be scheduled for periodic inspection. Numeric values are assigned, for example, to equipment function, risk level, and required maintenance. Devices are included in the support program only if the total score is above a specified value.

Although this approach seems to simplify the decision-making process and to make it less subjective, subjectivity is actually "hidden" in the scores assigned to the various elements. The ease with which a number can be assigned may detract from the analysis that the decision maker should be conducting. Also, the scores of two elements are not additive. A device that requires maintenance for reliable operation must be included in the program, even if no other decision element has a high priority. Conversely, a medium score on several elements, none of which alone is a high priority, still does not justify inclusion simply because their total score is above a certain threshold. Each element must be considered independently.

Thus, while numerical tools may be very useful in some cases, they must be used as guidelines and with codes, standards, and regulations. The four elements are then reviewed together; however, *support decisions are based largely on the individual concerns or issues that are included in these four elements.* Thus, for example, a high-risk level may be a cause for concern, but only examination of the specific risks associated with the device determine what preventive measures are appropriate. IPM may not be effective at minimizing risks and thus should be minimized or eliminated even for some high-risk devices.

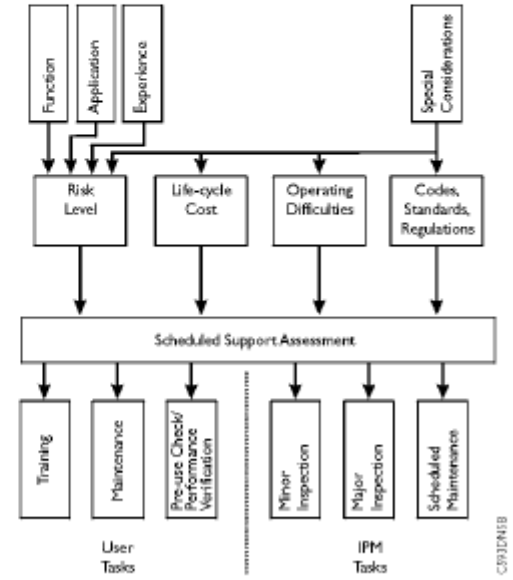

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Figure 1. Elements of Scheduled Support

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How can we access the system?

- Annual subscription (unlimited access)
  - Contributing user – £675 (€800) +VAT
  - Non-contributing user – £995 (€1180) +VAT
- We send you a Username and Password to log onto the BiomedicalBenchmark website

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Thank you for your attention

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