Evaluation of Plant and Machineries: Case Study of PZ Nigeria.

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ABSTRACT

Evaluation is the method of estimating the present value of a property. The aims and objectives of this valuation study are to determine the present condition of a plant and machinery after engineering tests and trials, review the past operational and financial performance of the plant, assess the probable remaining operational life of the plant and machinery, determine the actual useful life of the plant and machinery, establish relationships between efficiency of plant and maintenance practice/policy plan, and estimate the realizable value of plant and machinery based on replacement value concept.

(Keywords: evaluation, industrial plant, machinery, Nigeria, performance)

INTRODUCTION

Until 1925 there was no specific statutory provision for the rating of industrial plants and machinery. Despite this, it has been long established that certain components of a plant and its machinery are intended to remain on the premises to make the premises fit for its established purpose and are considered as part of the property. This view was upheld by the courts in a series of cases, including R vs. St. Nicholas, Gloucester (1783), Tyne Boiler Works Co. vs. Longbenton (1886), and Kirby vs. Hunslent Union (1906). Tools and other items such as stock in trade were not rateable.

In 1925, the position was formalized following the report of the Shortt committee with the passing of the Rating and Valuation Act. Section 24 and Schedule 3 of the Act provided a list of classes of plants. Class 1 rates all items of plant and machinery listed in Table 1 of the regulations and in paragraph 1 and 2 of the list of accessories are only rateable if they are used for the handling, preparing or storing of fuel required for the generation of power. "Power" will include the generation of steam power, electrical power, pneumatic power, hydraulic power and any other forms of motive power.

Class 2 deals with service plants and machinery for:

- Heating, cooling and ventilation;
- Lighting;
- Drainage;
- Supplying water;
- Protection from hazard.

For a plant to be rateable under class 2, it must be:

- named in class 2 and
- used in connection with the provision of the specific services listed in class 2 and
- provides the services to the hereditament
- is mainly or exclusively so used for that purpose and
- is not exempted by being used for manufacturing or trade processes.

Class 3 deals with various types of infrastructure on a property. It is divided into the following main categories of plants and machinery:

- railway train lines and their fixed accessories;
- lifts, elevators, hoist, escalators and travelators;
- cables for the conduct of electricity and their accessories;
- cables, fibers, wires and conductors for the transmission of communication signals and their associated equipment;
- pipelines;
- locks, dock gates and caissons.

(*Source: www.books.google.com.ng/books*)

RELEVANT THEORIES ON PLANT AND MACHINERY VALUATION

Often, the rent paid for a property will reflect the value of items of rateable service type plant and machinery. Analysis and therefore valuation can be undertaken including theses items in the values per m^2. Other types of plants will not usually be included in a rent and will be shown separately in a valuation usually valued by the contractors' basis of valuation. While shown as separate items in the valuation, they must be regarded as part of the property and not looked at in isolation.

In most cases, there is little rental evidence for non-service plant and machinery and valuation is undertaken using the contractor's basis. The capital cost of the item is ascertained and after making appropriate adjustments, a percentage applied to arrive at the rental value of the item.

Two approaches to a cost valuation can be used:

i. The cost of new plant can be ascertained. The cost should not only include the cost of the plant but also the full cost of installation together with any other associated work (foundation etc.) from this amount the cost any non-rateable element will have to be deducted. The actual item being valued may in reality not be new so some adjustment may be needed for any technical, physical and economic obsolescence of the item. The resultant figure is then decapitalized at the statutory decapitalization rate to arrive at the rental value of item.

ii. An alternative approach is to examine second-hand costs of the item of similar plant. Where this approach is adopted again, it is the cost of the installed plant that has to be considered. (*source: www.books.google.com.ng/books*)

For plant and machinery (P&M) valuers, the standard of value most used in descriptions of value is market value. Yet market value by itself is not sufficient as a descriptor of value because an asset can be exchanged for money or monies' worth in several conceivable ways. Some of these ways have been identified and collectively they are known as premise of value. An asset will then have several market values, equal in number to the premises of value attached to the market value. Each combination of standard and premise produces a different figure of value.

A premise of value when attached to a standard of value in binary combination completes the description of a transactional event. Use of a premise of value to qualify a standard of value also serves to cut down on the proliferation of the number of separate standards of value.

When the appropriate premise of value is dictated by statutory or other regulatory mechanisms as in rating and eminent domain valuations the premise of value is fixed by law or regulation. Thus rating valuation is in most jurisdictions premised on *rebus sic stantibus* (as it is, not as it can be). Eminent domain is often premised on some arbitrary requirement like excluding development potential. Apart from statutory and other nonmarket valuations where the standards are fixed, other determination of premise of value requires close understanding of the asset and its mode of sale.

For valuations that seek market value, the highest and best use concept is the most potent in pointing out what marketplace or level of trade the exchange is best conducted. The marketplace affects the price and may indicate the premise of value. For example the sale- to- dealer market gives lower prices than the dealer –to-end -user market. The former exchange may be described as orderly liquidation value, while the latter exchange may be described by market value with the premise silent and understood by contextual inference. The level of trade, on the other hand distinguishes the fact that some assets are best sold piecemeal, others are best sold as part of a going concern. This time we have a clue as to what is the best premise of value. If piecemeal, then orderly liquidation value is indicated; if the intention is to sell as part of a going concern, then market value in continued use is the standard of value. (*source:www.ssrn.com/abstract=995203*)

MATERIALS AND METHODS

Valuation Methodology

Data Generation: Data used for the valuation of the Company's Plants were obtained from the available records of the company, as presented in subsequent section of this valuation report. Relevant members of staff were also interviewed and other useful information was also rendered, were presented using tables, graphs and figures in their appropriate forms.

The valuation study covers plants used in the Toiletries Factory of the company. The Plants so evaluated are:

1. Deionized Water Plant;
2. Silverson Batch Mixer;
3. Graco Jelly Pump;
4. Norden Pack Boxing Machine;
5. Marden Edward Overwrapping Machine;
6. Subnil Tube Filler;
7. Cartoning Machine;
8. Rotary Capping Machine;
9. Response Filler; and
10. Labeling Machine.

Analytical Tool:

1. Declining-Balance (DB) and Double Declining-Balance (DDB) Depreciation model was used to determine the depreciable life of the plants based on the company's depreciation policy.

2. Minimum-cost Life Analysis was used to determine the economic life (actual useful life) of the plants. This model is used to determine the length of time that the plants should be kept in service to minimize its total cost with the time value of money.

Procedure, Processing and Analyzing Data

Economic Life: In determining the minimum-cost life (Economic Life) 'n', then EUAC approach is employed. Minimum-cost life 'n' is the number of years which yields a minimum annual cost.

$$EUAC_K = P(A/P, i\%, K) - SV_K (A/F, i\%, K) + [\sum AOC, (P/F, i\%, J)](A/P, i\%, K).$$

To find the minimum-cost life, increase the life value index k from 1 to the largest expected life 'N', that is, k=1,2,……….N. For each k, determine the value of $EUAC_K$. With each passing year, the following apply to an asset that is currently in place:

- Yearly cost of operation and maintenance decreases;
- Realizable market or salvage value decreases;
- Ownership cost due to initial investment in terms of EUAC decreases.

These cost factors usually cause the total EUAC to decrease for some years and then increases.

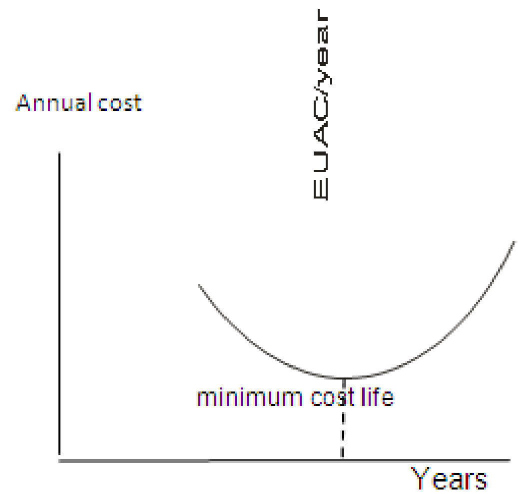

Figure1: EUAC Curve.

In determining the economic life of mechanical items, the point is that mechanical items become less efficient and accumulate higher and higher repair bills as they age. Conversely, the longer they are kept in operation, the lower their average annual capital cost (average first cost) will be because the purchase price is spread over more years. The sum of these two types of cost is the total cost of providing the machine services. The total lifetime cost continues to increase with age, but average annual cost (total annual cost) passes through a minimum.

Assumptions:

- No inflation in cost of machinery/plant throughout its economic life.
- Interest rate 'i' for use of capital is equal to zero, i=0.
- Annual utility and material cost have no effect on increasing operation cost.
- Salvage value of machinery/plant is negligible.
- Since the base operation cost could not be obtained, the graph of annual operation cost against age of plant follows a linear pattern starting from the origin.

- For the fact that salvage value is negligible and i=0, the Total Annual Cost (TAC) model is given as:

$$TAC_n = \frac{\sum_{j=2}^{x} AOC_j}{n} + \frac{P}{n} \quad (1)$$

$$\frac{\sum_{j=2}^{x} AOC_j}{n} = B\left(\frac{n-1}{2}\right)G \quad (2)$$

By substituting Equation 2 into Equation 1:

$$TAC_n = B + \left(\frac{n-1}{2}\right)G + \frac{P}{n} \quad (3)$$

Where:
TAC_n = total annual cost for n years of ownership.
AOC_j = annual operating cost

through year j (j=1,2,…………,n)

B = base amount of the gradient
G = amount of gradient
P = cost of purchase

Taking the derivative of Equation 3, an equation for the optimum life value (Economic Life) n* could be obtained.

$$\frac{dTAC_n}{dn} = \frac{G}{2} - \frac{P}{n^2} = 0$$

$$n^* = \left(\frac{2P}{G}\right)^{1/2} \quad (4)$$

Depreciable Life/Realizable Value

In determining the depreciable life and realizable value of the machinery/plant, the declining-balance (DB) and double-declining-balance (DDB) method is employed. This method is used by multiplying a uniform percentage by the book value (adjusted basis) at the beginning of that year. The general model for calculating the maximum DB rate d_M is ($d_M = 2/n$). This is rate used for the DDB method. The actual depreciation rate, relative to the unadjusted basis B for year t is computed as:

$$d_t = d(1 - d)^{t-1}$$

The depreciation D_t for year t is the uniform rate d times the book value at the end of the previous year, that is:

$$D_t = (d)BV_{t-1} \quad (5)$$

The book value in year t is:

$$BV_t = B(1 - d)^t \quad (6)$$

Therefore, $D_t = (d)B(1 - d)^{t-1}$ **(7)**

Since the salvage value in declining-balance methods does not go to zero, an implied SV after n years may be computed as:

$$\text{Implied SV} = BV_n = B(1 - d)^t \quad (8)$$

$$SV = B(1 - 2/n)^t$$

Where
t = year (t = 1,2, ………..,n)
Dt = annual depreciation charge
B = first cost or unadjusted basis (cost of purchase)
SV = salvage value
n = expected depreciable life

PRESENTATION, ANALYSIS AND INTERPRETATION OF DATA

In this chapter, the data are presented, analyzed and interpreted as follows:

Table 1: Deionized Water Plant.

MANUFACTURES'S NAME	ELGA Process Water
MANUFACTURER'S ADDRESS	High Street, Lane end, High Wycombe Bucks, England.
DATE OF MANUFACTURE	18th June, 2004.
DATE OF PURCHASE	29th July,2004
COST OF PURCHASE	£ 60,000 (₦12,900,000)
DATE OF MACHINE INSTALLATION	30th October, 2004.
MACHINE CAPACITY	2.25 m^3/hr.
FREQUENCY OF USE	24 hours per day.
FREQUENCY OF MAINTENANCE	Weekly
FREQUENCY OF BREAKDOWN	Rarely breaks down.
PREVIOUS PROBLEMS	No flow
REMEDIES/PARTS CHANGED	Filter
DATE OF LAST SERVICE	6th February,2010
PRESENT CONDITION OF MACHINE	In service (Ok)
MAINTENANCE PLAN	
MAINTENANCE COST	Not available
AVAILABILITY OF SPARES	Readily available
RECOMMENDED LUBRICANT	Nil
AVAILABILITY OF MAINTENANCE RECORD	Up to date

Economic Life of Deionized Water Plant

From Equation 4, $n^* = \left(\frac{2P}{G}\right)^{1/2}$

$$G = \frac{640{,}000 - 0}{5 - 0}$$

G =₦128, 000

Therefore, $n^* = \left(\frac{2 \times 12{,}900{,}000}{128{,}000}\right)^{1/2}$

n* = 14 years

Realizable Value of Deionized Water Plant

$SV = B(1 - 2/n)^t$

If n* = n = t = 14 years, then $SV = 12{,}900{,}000(1 - 2/14)^{14}$

SV = ₦1,489,466.16

Table 2: Silverson Batch Mixer.

MANUFACTURES'S NAME	Silverson Machines Limited
MANUFACTURES'S ADDRESS	Waterside, Chesham, Bucks, England.
DATE OF MANUFACTURE	19th June, 2006.
DATE OF PURCHASE	17th January, 2007.
COST OF PURCHASE	£ 25,000
DATE OF MACHINE INSTALLATION	22nd February, 2007.
MACHINE CAPACITY	110 kilogram per hour
FREQUENCY OF USE	8 hours per day.
FREQUENCY OF MAINTENANCE	Weekly
FREQUENCY OF BREAKDOWN	Not often.
PREVIOUS PROBLEMS	Bad Bushing.
REMEDIES/PARTS CHANGED	Blade
DATE OF LAST SERVICE	30th January, 2010.
PRESENT CONDITION OF MACHINE	In service (Ok)
MAINTENANCE PLAN	Not available
MAINTENANCE COST	Not available
AVAILABILITY OF SPARES	Readily available
RECOMMENDED LUBRICANT	Grease
AVAILABILITY OF MAINTENANCE RECORD	Up to date

Table 3: Graco Jelly Pump.

MANUFACTURR'S NAME	Graco Inc.
MANUFACTURER'S ADDRESS	88-11th Avenue NE | Minneapolis, Minnesota 55413
DATE OF MANUFACTURE	19th February, 2003.
DATE OF PURCHASE	8th June, 2006.
COST OF PURCHASE	USD 200,000 (₦35,000,000)
DATE OF MACHINE INSTALLATION	26th July, 2006.
MACHINE CAPACITY	
FREQUENCY OF USE	24 hours per day.
FREQUENCY OF MAINTENANCE	Weekly
FREQUENCY OF BREAKDOWN	Often
PREVIOUS PROBLEMS	Blockage
REMEDIES/PARTS CHANGED	Wiper
DATE OF LAST SERVICE	23rd January, 2010.
PRESENT CONDITION OF MACHINE	In service (Ok)
MAINTENANCE PLAN	
MAINTENANCE COST	Not available
AVAILABILITY OF SPARES	Readily available
RECOMMENDED LUBRICANT	Grease
AVAILABILITY OF MAINTENANCE RECORD	Up to date

Economic Life of Graco Jelly Pump

From Equation 4, $n^* = \left(\frac{2P}{G}\right)^{1/2}$

$$G = \frac{156{,}000 - 0}{4 - 0}$$

G = ₦39,000

Therefore, $n^* = \left(\frac{2 \times 35{,}000{,}000}{39{,}000}\right)^{1/2}$

n* = 42.4 years

Realizable Value of Graco Jelly Pump

$SV = B(1 - 2/n)^t$

If n* = n = t = 47.4 years, then
$SV = 35{,}000{,}000(1 - 2/42.4)^{42.4}$

SV = ₦4,505,491.55

Table 4: Nordenpack Boxing Machine.

MANUFACTURER'S NAME	Norden Packaging Machinery.
MANUFACTURER'S ADDRESS	S-39128, Kalmer, Sweden.
DATE OF MANUFACTURE	2nd November, 1983.
DATE OF PURCHASE	27th July, 1984.
COST OF PURCHASE	USD 150,000
DATE OF MACHINE INSTALLATION	23rd May, 1985.
MACHINE CAPACITY	60 cycles per minute.
FREQUENCY OF USE	8 hours per day.
FREQUENCY OF MAINTENANCE	Weekly
FREQUENCY OF BREAKDOWN	Often
PREVIOUS PROBLEMS	Improper Boxing.
REMEDIES/PARTS CHANGED	Suction Cup.
DATE OF LAST SERVICE	13th February, 2010.
PRESENT CONDITION OF MACHINE	In service (Ok)
MAINTENANCE PLAN	
MAINTENANCE COST	Not available
AVAILABILITY OF SPARES	Imported
RECOMMENDED LUBRICANT	Oil and grease
AVAILABILITY OF MAINTENANCE RECORD	Up to date

Table 5: Marden Edwards Overwrapping Machine.

MANUFACTURES'S NAME	Marden Edwards Limited.
MANUFACTURES'S ADDRESS	2 Nimrod way, Ferdown Industrial Estate, Wimborne, Dorset U.K.
DATE OF MANUFACTURE	18th April, 2001.
DATE OF PURCHASE	3rd July, 2002.
COST OF PURCHASE	USD 450,000 (₦78,750,000)
DATE OF MACHINE INSTALLATION	10th October, 2002.
MACHINE CAPACITY	45 cycles per minute.
FREQUENCY OF USE	8 hours per day.
FREQUENCY OF MAINTENANCE	Weekly
FREQUENCY OF BREAKDOWN	Often
PREVIOUS PROBLEMS	Improper Cutting of nylon.
REMEDIES/PARTS CHANGED	Cutting blade.
DATE OF LAST SERVICE	13th February, 2010.
PRESENT CONDITION OF MACHINE	In service (Ok)
MAINTENANCE PLAN	
MAINTENANCE COST	Not available
AVAILABILITY OF SPARES	Imported
RECOMMENDED LUBRICANT	Oil and grease
AVAILABILITY OF MAINTENANCE RECORD	Up to date

Economic Life of Marden Edward Overwrapping Machine

From Equation 4, $n^* = \left(\frac{2P}{G}\right)^{1/2}$

$$G = \frac{1{,}160{,}000 - 0}{7 - 0}$$

G = ₦165,714.29

Therefore, $n^* = \left(\frac{2 \times 78{,}750{,}000}{165{,}714.29}\right)^{1/2}$

n* = 30.83 years

Realizable Value of Marden Edward Overwrapping Machine

$SV = B(1 - 2/n)^t$

If n* = n = t = 30.83 years, then $SV = 78{,}750{,}000(1 - 2/30.83)^{30.83}$

SV = ₦9, 949,573.39

Table 6: Subnil Tube Filler.

MANUFACTURER'S NAME	Subnil Packaging Machines PVT Limited.
MANUFACTURER'S ADDRESS	Shed No. 37, Road No. 1, IDA-Mallapur Nacharam, India.
DATE OF MANUFACTURE	2nd March, 2003.
DATE OF PURCHASE	22nd May, 2003.
COST OF PURCHASE	USD 1,500,000
DATE OF MACHINE INSTALLATION	17th July, 2003.
MACHINE CAPACITY	60 cycles per minute.
FREQUENCY OF USE	8 hours per day.
FREQUENCY OF MAINTENANCE	Weekly
FREQUENCY OF BREAKDOWN	Often
PREVIOUS PROBLEMS	Bad tube sealing.
REMEDIES/PARTS CHANGED	Sealing Jaw.
DATE OF LAST SERVICE	30th January, 2010.
PRESENT CONDITION OF MACHINE	In service (Ok)
MAINTENANCE PLAN	
MAINTENANCE COST	Not available
AVAILABILITY OF SPARES	Imported
RECOMMENDED LUBRICANT	Oil and grease
AVAILABILITY OF MAINTENANCE RECORD	Up to date

Table 7: Cartoning Machine.

MANUFACTURER'S NAME	Pampac Machine PVT Limited.
MANUFACTURER'S ADDRESS	Associated capsule group, 127 Kandi wali Industrial Estate, Kandi wali, Bombay, India.
DATE OF MANUFACTURE	21st May, 2002.
DATE OF PURCHASE	18th June, 2004.
COST OF PURCHASE	USD 800,000
DATE OF MACHINE INSTALLATION	2nd December, 2005.
MACHINE CAPACITY	80 cycles per minute.
FREQUENCY OF USE	8 hours per day.
FREQUENCY OF MAINTENANCE	Weekly
FREQUENCY OF BREAKDOWN	Often
PREVIOUS PROBLEMS	Poor folding.
REMEDIES/PARTS CHANGED	Folding plate.
DATE OF LAST SERVICE	13th February, 2010.
PRESENT CONDITION OF MACHINE	In service (Ok)
MAINTENANCE PLAN	
MAINTENANCE COST	Not available
AVAILABILITY OF SPARES	Imported
RECOMMENDED LUBRICANT	Oil and grease
AVAILABILITY OF MAINTENANCE RECORD	Up to date

Table 8: Rotary Capping Machine.

MANUFACTURER'S NAME	Purdy Gravfil Limited.
MANUFACTURER'S ADDRESS	Henwood Industrial Estate, Hythe Road, Ashford Kent, England.
DATE OF MANUFACTURE	4th February, 1991.
DATE OF PURCHASE	2nd May, 2000.
COST OF PURCHASE	USD 150,000 (₦26,250,000)
DATE OF MACHINE INSTALLATION	3rd May, 2000.
MACHINE CAPACITY	100 cycles per minute.
FREQUENCY OF USE	10 hours per day.
FREQUENCY OF MAINTENANCE	Weekly
FREQUENCY OF BREAKDOWN	Often
PREVIOUS PROBLEMS	Poor capping.
REMEDIES/PARTS CHANGED	Ejection rod.
DATE OF LAST SERVICE	23rd January, 2010.
PRESENT CONDITION OF MACHINE	In service (Ok)
MAINTENANCE PLAN	
MAINTENANCE COST	Not available
AVAILABILITY OF SPARES	Available
RECOMMENDED LUBRICANT	Oil and grease
AVAILABILITY OF MAINTENANCE RECORD	Up to date

Economic Life of Rotary Capping Machine

From Equation 4, $n^* = \left(\frac{2P}{G}\right)^{1/2}$

$$G = \frac{360{,}000 - 0}{10 - 0}$$

$G = ₦36{,}000$

Therefore, $n^* = \left(\frac{2 \times 26{,}250{,}000}{36{,}000}\right)^{1/2}$

$n^* = 38.19\ year$

Realizable Value of Rotary Capping Machine

$SV = B(1 – 2/n)^t$

If n* = n = t = 38.19 years, then $SV = 26{,}250{,}000(1 – 2/38.19)^{38.19}$

SV = ₦3,360,779.70

Table 9: Response Filler.

MANUFACTURER'S NAME	Adelphi Group.
MANUFACTURER'S ADDRESS	Olympus House, Mill green Road, Hayward's Health, U.K.
DATE OF MANUFACTURE	18th August, 2005.
DATE OF PURCHASE	20th September, 2006
COST OF PURCHASE	USD 25,000 (₦4,375,000)
DATE OF MACHINE INSTALLATION	3rd December, 2006.
MACHINE CAPACITY	45 cycles per minute.
FREQUENCY OF USE	8 hours per day.
FREQUENCY OF MAINTENANCE	Weekly
FREQUENCY OF BREAKDOWN	Often
PREVIOUS PROBLEMS	Leakages.
REMEDIES/PARTS CHANGED	Seal.
DATE OF LAST SERVICE	18th February, 2010.
PRESENT CONDITION OF MACHINE	In service (Ok)
MAINTENANCE PLAN	
MAINTENANCE COST	Not available
AVAILABILITY OF SPARES	Readily available.
RECOMMENDED LUBRICANT	Oil
AVAILABILITY OF MAINTENANCE RECORD	Up to date

Economic Life of Response Filler

From Equation 4, $n^* = \left(\frac{2P}{G}\right)^{1/2}$

$$G = \frac{16,000 - 0}{3 - 0}$$

$G = ₦\,5,333.33$

$$n^* = \left(\frac{2\,x\,4,375,000}{5,333.33}\right)^{1/2}$$

Therefore, $n^* = 40.50\ years$

Realizable Value of Response Filler

SV = B(1 – 2/n)^t

If n* = n = t = 40.50 years, then
SV = 4,375,000(1 – 2/40.50)$^{40.50}$

SV = ₦562,198.08

Economic Life of Labeling Machine

From Equation 4, $n^* = \left(\frac{2P}{G}\right)^{1/2}$

$$G = \frac{50,000 - 0}{3 - 0}$$

$G = ₦16,666.66$

$$n^* = \left(\frac{2\,x\,2,625,000}{16,666.66}\right)^{1/2}$$

n* = 17.75years

Realizable Value of Rotary Capping Machine

SV = B(1 – 2/n)^t

If n* = n = t = 38.19 years, then
SV = 2,625,000 (1 – 2/17.75)$^{17.75}$

SV = ₦314,326.04

Table 10: Labeling Machine.

MANUFACTURER'S NAME	Harlard Machines System Limited.
MANUFACTURER'S ADDRESS	2, Michigan Avenue, Salford, Manchester, U.K.
DATE OF MANUFACTURE	17th July, 2006.
DATE OF PURCHASE	9th October, 2006.
COST OF PURCHASE	USD 15,000 (₦2,625,000)
DATE OF MACHINE INSTALLATION	12th November, 2006.
MACHINE CAPACITY	60 cycles per minute.
FREQUENCY OF USE	10 hours per day.
FREQUENCY OF MAINTENANCE	Weekly
FREQUENCY OF BREAKDOWN	Rarely
PREVIOUS PROBLEMS	Label folding.
REMEDIES/PARTS CHANGED	Label release roller.
DATE OF LAST SERVICE	18th February, 2010.
PRESENT CONDITION OF MACHINE	In service (Ok)
MAINTENANCE PLAN	
MAINTENANCE COST	Not available
AVAILABILITY OF SPARES	Imported
RECOMMENDED LUBRICANT	Oil
AVAILABILITY OF MAINTENANCE RECORD	Up to date

Table 11: Summary of Economic Life, Realizable Value of Machinery & Remaining Operational Life

Machinery	Economic Life n* (years) approx.	Realizable value (naira ₦)	Probable Remaining Operational Life (years)	Present Value of Plant and Machinery (naira ₦)
Deionized Water Plant	14	1,489,466.16	9	5,966,878.38
Silverson Batch Mixer	-	-	-	-
Graco Jelly Pump	42	4,505,491.55	32	28,794,586.62
Nordenpack Boxing M/C	-	-	-	-
Marden Edward Overwrapping M/C	31	9,949,573.39	24	49,374,725.13
Subnil Tube Filler	-	-	-	-
Cartoning M/C	-	-	-	-
Rotary Capping M/C	38	3,360,779.70	28	15,286,862.15
Response Filler	41	562,198.08	38	3,765,479.68
Labelling M/C	18	314,326.04	15	1,843,621.40

CONCLUSION

An evaluation of the case study plant and machinery (PZ Nigeria) was successfully carried out for the company.

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