LARRY: ISN'T IT A SHAME THAT "PRIDE of AUTHORSHIP" PREVENTS US FROM USING THEIR VE PROGRAM

With the compliments of

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VALUE ENGINEERING 68-23
IN YOUR FUTURE

1968

THE PHONE RANG IN JAN.
PRES. OF A SMALL COMPETITIVE BUSINESS--
REGULATOR STORY

THE PRES OF A LARGE CO SAID
"PREPARE A PLAN THAT WILL TAKE
US IN AN ORDERLY FASHION OUT
OF THE RADIO BUSINESS"

A PHD - LEADER IN THE PAINT INDUSTRY -
Dr Scott Long - SAID "WHY DO we have to
spend hundreds of millions of $ annually
because paint flakes or blisters or chalks off?"
THE PAINT STORY.

IN - THE MERRIMAC
IN 1940 RADAR
IN 1960 JET ENGINE
AT PRESENT --- NYLON

A SITUATION TOOK ON NEW IMPORTANCE
A BETTER WAY OF DEALING WITH IT WAS AT HAND
IT WAS RECOGNIZED AS THE WAY TO MEET
THAT NEED

HAD A COST PROBLEM THAT BECAME IMPORTANT

DECIDED TO SOLVE IT INSTEAD OF "HOPE IT WOULD GO AWAY"

RECOGNIZED VALUE ANALYSIS AS THE SPECIFIC TREATMENT FOR THAT SPECIFIC PROBLEM

MANAGEMENT INVOLVED THEMSELVES

Now
COMPETITIVE COSTS HAVE BECOME IMPORTANT - ARE HERE TO STAY

JUST AS
STEEL SHIPS, RADAR DETECTION, NYLON and JET ENGINES ARE HERE TO STAY

A couple YEARS AGO
PRES - SWEDISH CO
40 COS in EUROPE MAKE SHIP MOTORS
10 WILL STAY
I EXPECT TO BE ONE OF THE 10
"MAKE IT FOR ½ The cost"
After 1 week seminar - prove Don't need it"
wed pm second week

"IN JULY 1964
I SAT IN OFFICE OF PRES OF
ROLLS ROYCE -- "~~JET E~~

LATER
I CONGRATULATE ALL OF YOU -
YOU HAVE STARTED TO LEARN THIS
ORDERLY ~~SYSTEM~~ AND TIMELY
SYSTEM

COPE - PSYCHOLOGIST
Competition -

"what did he say?"

---

what funct. to user for ea $ spent -

Determine

will get more info
will test info
will test assumptions
will take nothing for granted
will avoid pre-decision -
will have comparison cost info
before cost decisions
will ~~find~~ search & find other
means -
will clearly identify reason for costliness

VALUE ENGRG IN YOUR FUTURE

IN WHAT ENVIRONMENT WILL YOUR FUTURE BE?

PSYCHOLOGIST - "TEACH TO COPE"

SOCIOLOGICAL ENVIRONMENT

T

TECHNOLOGICAL ENVIRONMENT

ENVIRONMENT OF COMPETITION

GE vs ROLLS ROYCE

DIFF. FROM YESTERDAY - DIFF-FROM TODAY

WILL YOU BE ABLE TO COPE?

MAYBE I CAN HELP A LITTLE

SWEDEN - ~~VS~~ "AFGRS OF MOTORS" -- WELL BE ONE OF THE 5

GOOD VS EXCELLENCE

CHAMPION GOLFER, FIGHTER

~~PLAYS~~

MEETS COMPETITION - BASED ON RULES OF

THAT COURSE.

AT THAT TIME

PERFORMS EACH

PLANNING

& EACH STROKE AS GOOD AS

OR A LITTLE BETTER

YOU'VE HAD EXPERIENCE THIS WEEK

WITH PARTS OF A GOOD PLAN

PERHAPS 1/10 OF IT.

LIKE ANY GOOD COLLEGE OR OTHER COURSE ITS ENUF -- SO YOU CAN LEARN MORE.

THIS DISCIPLINED THINKING PROCESS WAS BORN UNDER FIRE -- OF THE NEED FOR TODAY & PROBABLY THE NEXT 10 YRS.

IT HAS ~~SUCCESSFULLY SOLVED~~ Brought success to SOME SIGNIFICANT JOBS. WHERE USED

REGULATOR some Q less cost

RADIO - same Q less cost

JETENGINE - ~~WEIGHT~~

PAINT Q

COLLECT TAXES

VARNISH - cost Q+

Rolls Royce some Q less cost More business -

RIGHT AIM
" THINKING
" TIME

WHAT IS NOT DONE?

- FIELDS OF OPP. FOR YOU -

DOD - Military Procurement	meaningful start	
Automotive	20%	not done
small Appliance	50%	" "
large "	60%	"
OTHER ELECTRO-MECH	90%	" "
CHEMICAL INDUSTRY	95%	" "
CONSTRUCTION	100%	" "
STATE AND MUNICIPAL	100%	" "
HOSPITAL AND MEDICAL	100%	" "

So - no MISUNDERSTANDING -

WHAT AM I TALKING ABOUT

BETTER
DEEPER
MORE THORO THINKING PROCESS

EVERY STEP BASIC

CUSTOMER FUNCTION

EVERY MEANS HUMANLY POSSIBLE TO PROVIDE THAT FUNCTION

NO HOLDS BARRED

VALUE ENGINEERING - ROLLS ROYCE

Foreign firms in partnership with U.S. companies are using American business methods to win bid contracts.

A prime example is Britain's Rolls-Royce, Ltd., which is to provide jet engines for America's Lockheed Aircraft airbus -- already boasting a multibillion-dollar stack of orders. The British engine edged out a U.S. General Electric bid to power the new planes.

But Rolls-Royce pursued the contract with reinforcements from the latest in U.S. management skills to insure efficiency. Chief tool: "value engineering," a concept often identified with General Electric.

The technique on this occasion called for design and production of goods at a low, preset price which would be at least 15 per cent cheaper than American-built engines. The British firm hired two former GE executives to make sure the approach worked. At one point, the "value engineers" made Rolls-Royce start all over again on blueprints because the first design was going to cost too much.

Another bow to American business methods comes in a new study reported in the British Ministry of Technology's journal, "New Technology." Covering firms in the electrical-engineering and electronics field, it finds U.S. companies are generally more profitable than British counterparts.

A 10 per cent profit on sales and a 25 per cent return on capital employed by American firms compared with corresponding figures of 9 per cent and 11.3 per cent for the British outfits. Sales per employe in the U.S. companies were found to be more than double the British volume.

Said to help the U.S. showing: higher caliber of management, better corporate spirit, better production and stock-control methods, and more successful use of computers in company operations.

Reprinted from The Australian Financial Review, Tuesday, April 9, 1968

Little more than a week ago, Rolls-Royce in Britain landed the biggest ever aero-engine contract to supply its RB-211 power plant in 94 Lockheed L-1011 air buses and followed this four days later with a further order to supply the RB-211 to 24 more of the aircraft. Total value of the orders should earn Rolls-Royce best part of £175 million. James Ensor, of the "Financial Times," London, explains the role of management in this success.

HOW ROLLS-ROYCE COMPUTES THE COST

THE REAL secret of Rolls - Royce's breakthrough on the Lockheed airbus order lies deep in the heart of its organisational structure. The RE-211 jet is not only an advanced technology engine, but also an advanced management engine.

This order, which ensures the company's future for a decade, is a classic demonstration of how a firm, which is properly geared to an appropriate objective, can succeed in one of the toughest markets of all.

For, make no mistake, Rolls-Royce owes this order only in part to the genius of its design team and the low cost of its labour.

Without management and control on a scale that matches the American exponents of successful business operation, it would not have been able to compete.

The story of the advanced technology engines—the RB-211 for the American airbus, the Trent for smaller European planes—really dates back to 1955.

Rolls-Royce was then primarily a military contractor supplying Avon jets to the R.A.F.

The Dart turboprop, used in the Viscount, was already providing good business, and the company appreciated that its future would be strongly dependent on the civil engine market.

The switch from cost-plus military contracts to the civilian market, where price and fuel economy are everything, involved a marked change in philosophy.

It was at this time that Rolls-Royce first started to inculcate cost consciousness into its design staff.

By 1963, this process had acquired a name—value engineering—ironically enough bestowed by General Electric, the arch-rival in the Lockheed and Douglas contracts.

As defined at Derby, it means an "organised system for eliminating cost in any product or system."

Basically, designers were taught to think of performance/cost instead of just performance (which is all that is required in military projects); cost is regarded as akin to a disease which must be eliminated.

Mr L. W. Crum, the chief value engineer at Rolls-Royce, has a beautiful example of value engineering which he produces to show visitors. It is a fireseal, which is used every time electrical cables pass through a bulkhead, in an aircraft or engine.

The traditional design is a beautifully produced piece, with a screw cap in finely bevelled aluminium with a ceramic core —specially made at Stoke; in short, it is a Rolls-Royce of a fireseal.

After the value engineer had a look at it, it was reduced to a rather rough welded ring with a core made of a nylon-paper compound.

The result: an ugly part, but with a cost only one-fifth the original, and a weight-saving into the bargain.

This approach was gradually adopted by the company throughout its aero-engine design work.

The first real test came on the Spey engine in 1965, as a result of the severe competition this engine was facing in the United States.

Eight value engineering teams, with basic training but led by senior managers, were set to work to analyse every aspect of the Spey's manufacture.

One of the more successful devices used was an exhibition of the engine with every part labelled for labour and material costs.

After two months' part-time work the teams came up with some appreciable savings, proving incidentally that detailed analysis can uncover unnoticed costs.

This was the turning-point for VE within Rolls-Royce.

Further teams were set up to analyse turbine blade manufacture, which is the only real bit of mass-production in an aero-engine.

The first fruit of this approach is the RB-211. To compete in the U.S., Rolls-Royce had to be able to undercut the domestic manufacturers by 15 per cent.

Value engineering on traditionally designed engines showed this to be impractical; but one outcome of VE on turbine blades was that the designers came up with a new idea.

Simple enough when you see it, it still might never have emerged without the design staff's involvement in cost.

Three turbine stages instead of two simplifies manufacture and improves performance.

Here is a real example of value engineering at work.

Turbines are the key cost element in aero engines, and it is here that the full weight of Rolls - Royce's management knowledge has been brought into play.

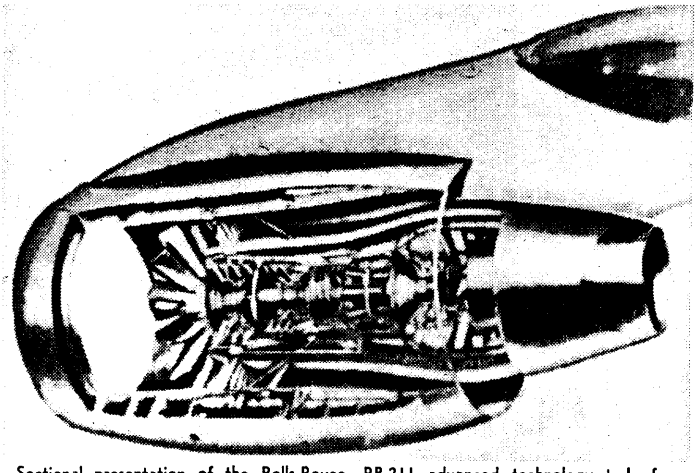
Turbine design, for instance, is the first area in which the company is using full computer aided design with graphical displays (in which a designer can draw parts on a TV type screen and make the computer do instantaneous calculations).

A computer actually designs die blocks for compressor blades and produces the tapes to operate automatic machines to cut them.

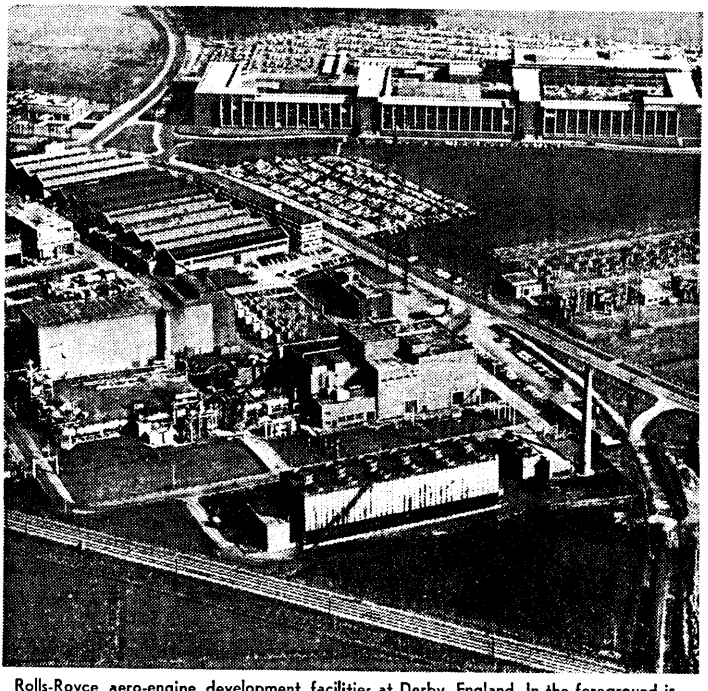
At the same time it designs and makes tapes to manufacture the inspection tools needed for the compressor.

This is fairly routine design work; nevertheless it used to take six months and was a contributory factor to the long lead times between the concept of a new engine and its manufacture.

Now it takes less than a week and could be done, at a pinch, in a day.



Sectional presentation of the Rolls-Royce RB-211 advanced technology turbo-fan engine which will power the Lockheed L-1011 airbus and which won the world's biggest jet order.



Rolls-Royce aero-engine development facilities at Derby, England. In the foreground is shown the company's altitude test facility which is capable of simulating engine operating conditions over a wide range of altitudes and aircraft speeds.