

New technology

higher skills and fewer jobs

The CEPPWAWU/TURP Petroleum Industrial Restructuring Audit (PIRA) found that petroleum companies are automating production at an increasing rate. The incidence of automation was higher in the refineries and depots and lower in the lubricants companies.

Investment in automation is driven by 'returns on capital employed' which is a financial measurement that calculates the income that new capital investments (machinery, technology etc) bring a company. Managers in refineries argue that they need return on capital employed to be at least 20% of the price of the capital in order for it to be profitable for them to invest in further capital. These returns are generally easy for the refineries to make given their high profitability.

But, given that the lubricants industry is currently stagnant, it is difficult to get high enough returns to justify investing in new technology. One lubricants manufacturer said that they had invested in new production technology in 1996, but their shareholders were waiting for sufficient returns before allowing them to invest in further technology.

Preparing for deregulation

The managers interviewed all expressed the opinion that increased automation was essential if the liquid fuels sector was to be deregulated. A refinery production

Gary Phillips identifies why managers invest in new technology and the impact that the new technology has on workers.

manager said, 'companies like ours overseas operate with half the number of people'.

The production manager at another refinery said there was a dilemma: 'Do we go for operator efficiency (training) or do we digitalise? We want the operator to be central but with international best practice going towards automation how much of a choice do we have?'

Deregulation would bring competition to the distribution aspect of the liquid fuels industry, which to date has operated in a protected environment. One depot manager made the point that: 'The challenge is to be cost effective because of competition and also because there is no clear indication of where the industry is going, especially with regards deregulation. So, there is a need to plan for the worst - which is a totally free market. This would mean becoming as competitive as possible and we can't wait for that to happen.' He saw automation as a part of this preparation.

The PIRA found that automation was concentrated in the following areas:

- process control;
- opening and closing of valves;
- the introduction of self-cleaning pipes (called 'pigable lines');
- materials handling (container movement, loading of product lines, packing of lubricants, etc);
- depot loading gantries;
- new computing and information systems (such as SAP).

Impact on workers—

Automation was seen to have three major impacts on work at petroleum companies.

These were:

- replacement of tasks previously done by workers;
- casualisation of low-skill jobs and thus developing a core-periphery workforce;
- integration of tasks done by workers facilitating teamwork and multi-skilling.

Managers at one refinery indicated that jobs had been lost to 'more reliable digital equipment'. Casual labour was being used in the lubricants companies when the machines conducting automated tasks broke down.

Permanent workers previously did these jobs, such as loading and packing, before they were automated. Casual labour is employed through labour brokers operating in the harbour and petrochemical hubs in which refineries and lubricants manufacturers are located.

Increasing skill levels?

Generally, the shopstewards reported that workers had found it easy to adapt to new technology, although illiterate workers were reported to struggle with the changes (ABET was not always available). Managers reported that technological change was leading to skill requirements increasing.

However, one production manager suggested that they were moving refinery performance away from relying on the skills of the console operators. He said: 'There is a joke, not one that I like, that the operator of the future will sit in front of the control panel and watch the performance indicators. Next to the operator is a dog and a bag of dog food. The operator sits and feeds the dog and if the operator tries to touch the control panel the dog bites the operator. That is seen as the ideal.'

A case study of automation

Virtually every company visited had recently upgraded its process control systems. The upgrading had included centralising and computerising process control. The picture that emerged was that the centralising of process control had the following effect:

- Responsibility was devolved towards the process controllers as planning and console functions became more integrated.
- The skill levels of console operators were improved in that they were operating new computer systems.
- Fewer workers were needed to fulfil process control functions.
- Physically demanding and dangerous jobs such as opening and closing valves were automated. This led to improved health and safety in process control.
- Refineries have been able to achieve greater stability and longer periods on optimum performance with digital process control than under previous (analogue) process control systems.

While the benefits for companies are clear, the danger for workers losing their jobs is also clear. In a sense, automation is a double-edged sword for workers: holding improved training and skill opportunities but also leading to job losses.



Pic Sasol

The petroleum sector is highly capital intensive.

New technology

The most important factor for companies when choosing between a number of technologies is cost (returns on capital), according to the managers interviewed. Regulations, particularly environmental regulations, are also a major factor.

There is increasing pressure on refineries to improve air quality (particularly through reducing the lead and sulphur content of their products) and produce petrol that releases less carbon monoxide when used in cars. This is causing refineries to restrict their choice of future technology. But also they have to 'retro-fit' or update old technology to conform to new environmental standards.

Decisions on when to update technology or introduce new technology are driven by a wide range of factors. The interviews gave the following as guidelines:

- when parent company international

standards are not being met by existing technology;

- 'best practice' by other refineries;
- employee and customer safety and ergonomic needs;
- can cost effectiveness be improved by technological change?
- can efficiency be improved by technological change?
- can product yield be improved (called 'plant integrity')?
- changing legal requirements, particularly around gas emissions.

Little influence

Workers are generally excluded from meaningful participation in technological change. The managers do not see it as an issue for negotiation and sometimes cite confidentiality as a problem. The union is usually only approached concerning technological change when the company is expecting retrenchments or changes to jobs. ★