

## Life-Cycle Costing - Overcome the Challenges

Interview by Helen Winsor, Oil & Gas IQ

*In this special double interview, Dr Paul Baguley, Research Fellow in Cost Engineering at Cranfield University and Peter Okafor, Head of the Department of Quantity Surveying at the Federal Polytechnic of Ogun State, Nigeria, join Oil and Gas IQ to discuss Life-Cycle Costing (LCC) in Shutdowns and Turnarounds.*

**Oil & Gas IQ:** Could you first of all please give a short overview of your background within Cost Engineering and the work that you've previously undertaken in your research.

**P Baguley:** I've been involved in Cost Engineering research for 11 years. My PhD was in Cost Model Development using artificial intelligence. I've worked at three universities, DeMontfort University, Durham University and Cranfield University for the last five years. I do a variety of cost engineering research, which I've increasingly taken in lifecycle costing because of its growing importance, and I work with industry on research and I also organise training and short courses with the Oil and Gas sector at Cranfield.

**P Okafor:** I am Peter Okafor. I work as a lecturer. I've been working for the past ten years in Nigeria as a lecturer. I'm the Head of Department. Quantity surveying is my background and I conducted some researches about 10-13 years ago when I did my postdoc Master's Degree, and it was connected to NETCO a subsidiary of NNPC Nigeria, when they were having some challenges concerning the connectivity of five lines [?] in the specific economy of Nigeria. I was involved in that project. I sorted out this challenge. I decided to take up the research so I gave them the results and there are a lot of improvements because we were having problems with connectivity. We have about three refineries in Nigeria: Warry refinery for Sacos [?] and the one at Kaduna where the problem was that they are designated to some depots. There was no interconnectivity between them. Because of that we have petroleum shortages, petroleum product shortages. I conducted a research. I went to them. At the end of it I submitted my results, and there is a lot of improvement there now.

**Oil & Gas IQ:** What specifically is lifecycle costing and what was the incentive to undertake research in this area?

**P Baguley:** I'll help answer this question from our general view at Cranfield. We found that lifecycle costing is becoming more important across industry. Lifecycle costing is more about the full lifecycle of a facility or entity in the Oil and Gas sector, or indeed, any sector. It covers lifecycle cost estimates and cost engineering in general, across, not just design and development, but the operations, the maintenance and eventual retirement of facilities as well. We found that lifecycle costing is becoming more important because of the pressure to obtain profit in general and across the full lifecycle. This is because of the current global economic state. I'd like to hand over to Peter now.

**P Okafor:** To put it in layman's term, lifecycle costing is the total cost of ownership of plant and machinery and this includes acquisition costs, operation and maintenance costs, and even compression or decommission. That is the basic for a layman, for anybody to understand it. You just put it this way and the person will understand. But as we go on we'll give you more complex definitions.

**Oil & Gas IQ:** What are the current challenges that oil refineries face with regard to technology, and how can LCC methodology help them to overcome these challenges? 2

**P Okafor:** The challenges are quite obvious. We all know about that. We are having problems with acquisition costs; the acquisition costs are rising every day, and even the operation and maintenance costs are equally rising rapidly. So there is no way you can not impact on lifecycle costing to take care of all these challenges. So these challenges are quite obvious. With the model we are bringing down to the conference, we have created, right from the time we developed that model, we have created a cost emphasis which is very, very, very important, because when you create a cost emphasis you are now talking about the need and the requirements of the main refinery you are trying to construct. So it is very, very important. Once you give the cost emphasis then you have even [?] designs to requirements which means your lifecycle costs must come down because you are taking so many things into consideration at the initial design stage. So these are the current challenges. And the model we have developed, by the time we bring it to the conference, understand it very well; people will understand what we are talking about.

**Oil & Gas IQ:** Do you believe that we can focus on lifecycle cost breakdown structure, CBS? Further, what is it exactly, and how can it help those within the industry?

**P Okafor:** Lifecycle cost breakdown structure is the systematic breakdown of costs from the cost category to the cost elements and the cost components. It's very, very important because the superiority of any model depends on detailed lifecycle cost breakdown structure. It is very, very, very important because experts will be watching at that level whether you have completed the important cost elements of that particular plant or equipment. So, for you to be able to explain lifecycle costing methodology very well, there must be a detailed lifecycle cost breakdown structure. So we have that. Our lifecycle cost breakdown structure is very, very, very unique. By the time we bring it to the conference, you will see the way we have divided our costs into categories, because when you have the categories [?] these cost categories are coded for you to identify various costs. Our model is very unique because you can even take the costing at any stage of the lifecycle. So, it's very, very important because the superiority of your model must be known through your cost breakdown structure.

**Oil & Gas IQ:** Although the research that you're focusing on is looking at oil refineries in particular, what can those working outside of the oil industry take away from the research that you're conducting?

**P Okafor:** We are bringing something very unique to the conference because the lifecycle costing we are talking about, we are coming there to speak in a universal language because economic models must go with very, very, very robust cost breakdown structure. Apart from the cost breakdown structure itself, we are coming up with something that will be very unique in the suppression of costs in this category. So what we are trying to do is that people that are coming there, we are now telling them that we have a lot of challenges because people should be more interested in bringing down costs because of the global economic situation in the whole world now. So we are coming there to speak a universal language; everybody should be interested in robust economic appraisal tools to take care of equipment and machinery in these days. So it's very, very important. They will gain a lot.

**Oil & Gas IQ:** Just to round us off, why would you say that this event is important right now for the turnaround professionals and what do you personally expect to gain from attending?

**P Baguley:** As Peter alluded to, I think in this world of cost management, lifecycle costing is generally important to plan cost management and be able to be aware of how to reduce costs or, indeed, on how to quantify risks upstream. This is also changing because of possible new contractual arrangements across different industry sectors where the scope of the ownership of the cost is changing and moving more towards the original producer of the facility or the components or the product. Therefore, service costs are becoming more important. To be able to understand cost management for the full lifecycle to reduce costs and manage risk for the full lifecycle is now more important commercially and is a potential new business model for, generally, industry sectors. We'd like to invite people to take part in the research as well. We're interested in talking to people about how they can take part in our research and benefit from our research for 3

minimal cost to ourselves because we're an existing project and don't need sponsorship, so we're interested in visiting companies and reporting to them on their problems and helping them out.

**Oil & Gas IQ:** Well, we hope it provides a useful forum for you. Finally, for those of our listeners who will be attending, what key learning lesson can they expect to take away from your particular presentation?

**P Okafor:** We are coming with a very robust lifecycle cost methodology, and by the time we're finished, I wouldn't want to let the cat out of the bag too early because we have a novel model to exhibit. By the time we come there, we would explain our models and bring in a new definition. We are coming up with a brand new definition of lifecycle costing, and it will be very, very interesting. So, we are coming with a total package. We may not go into the nitty-gritty of the estimating processes because of time limit; and secondly, we want to have some case studies to validate our model. By the time we validate our model, if you will be interested in us again you can invite us by 2012. We will now come and talk about the estimating processes. We all know that lifecycle costing is simply a way-stop on the never ending journey for reducing costs. It is clearly not a destination. We, as professionals and researchers, will continue to improve on the existing economic appraisal tools in order to achieve the lowest long-time cost of ownership.

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*Oil & Gas IQ's Shutdowns & Turnarounds 2013 will take place from 18 - 20 February 2013 in Aberdeen, Scotland. For further information please visit [www.shutdownsandturnarounds.com](http://www.shutdownsandturnarounds.com), call +44 (0)207 036 1300 or email [enquire@oilandgasiq.com](mailto:enquire@oilandgasiq.com)*

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