

## Consistent Plant Performance Through Operator Centered Visual Daily Management

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### Abstract



Rusal Aughinish (AAL) refinery is situated on the west coast of Ireland. The plant, which commenced operation in 1983, currently produces 1.99Mt/year of metallurgical grade alumina. The refinery functions with a Safety Management System (ISRS), Environmental Management System (ISO14001), Quality Management System (ISO9001), Energy Management System (ISO50001) and the Rusal Business System. Significant investments have been made to ensure on-going competitiveness. Performance is primarily in the hands of the plant operators. Great knowledge in organisations is often “locked in” or poorly shared. When knowledge is shared, information can remain unclear or misunderstood. Where great efforts are made to record and transfer knowledge, poor infrastructure can hinder clear communication. The AAL approach to this “knowledge” challenge has been to inform that knowledge on a daily basis. We have learned that knowledge needs to be accessible and the information that builds that knowledge be recorded and presented effectively using standardised and visualised formats. We wanted to develop solutions that were operator-centered, rather than engineer-centered. Therefore, we employed a design consultancy to “better listen” to the operators and then work with our Technical group. Today we believe that our solutions for sharing knowledge openly is one of the keys to our success.

**Keywords:** Alumina refinery, visual daily management, design consultancy, operator centered design.

### 1. Introduction

Rusal Aughinish (AAL) refinery is located on the west coast of Ireland. The plant commenced operation in 1983 with a current production capability of 1.99mt/yr.

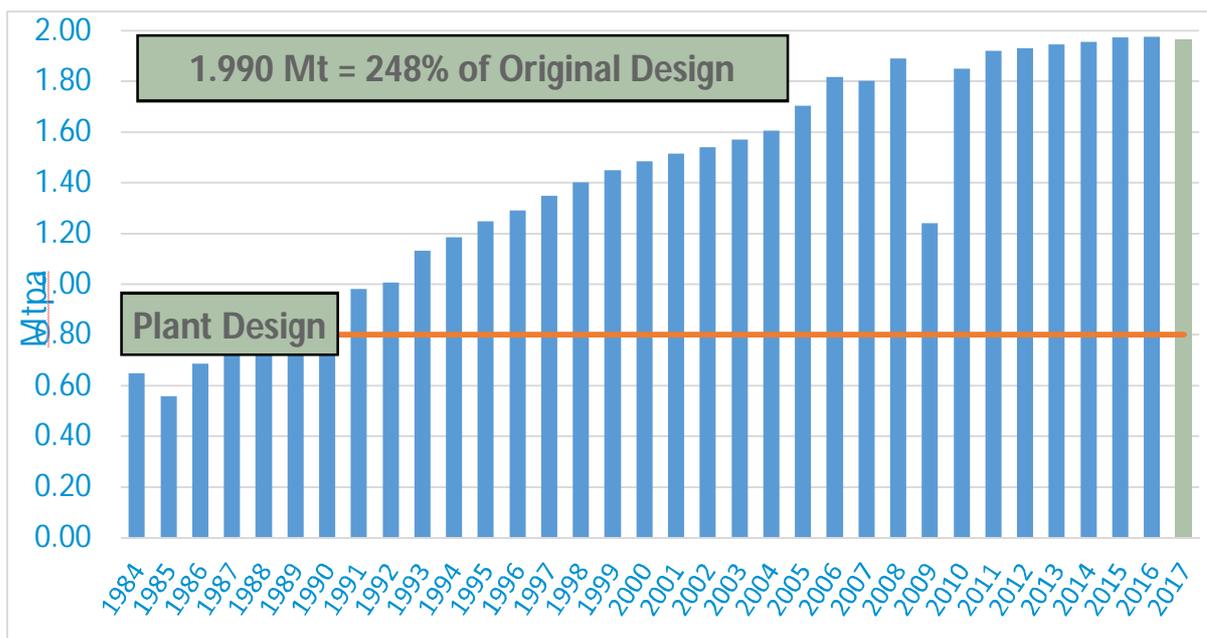
### 2. Performance

Key to the survival and prosperity of an alumina refinery is its performance. The non-negotiable objectives are excellent safety and environmental results. These are followed by the requirement to have an acceptable product quality.

As the business is essentially a commodity industry, the key to survival and prosperity is cost performance. This is dependent on a key number of strategic and operational issues. The critical measurement is cost per tonne of product.

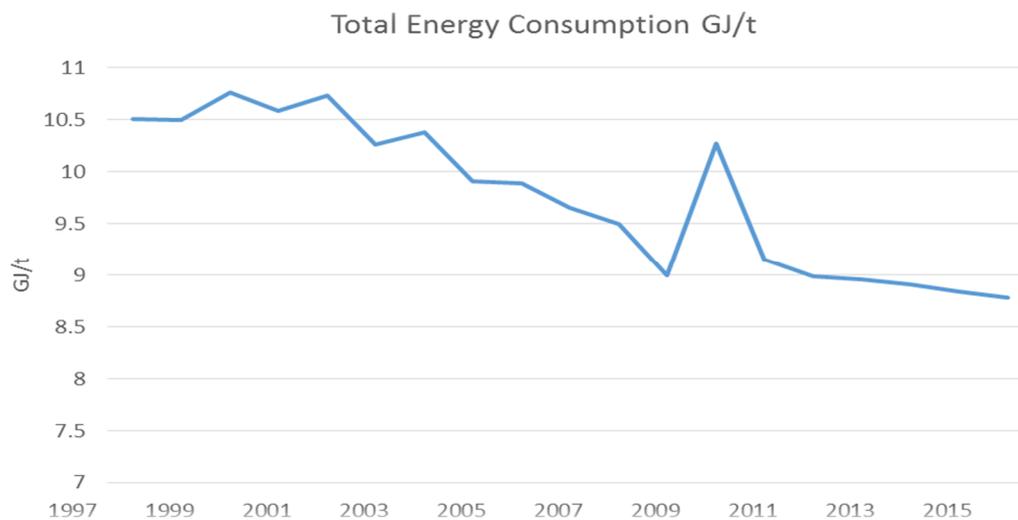
What was important to the Owner of AAL is that the production units, as agreed with refinery management, are delivered at the budgeted cost or better.

AAL has delivered its budgeted cost on a regular basis and this is underlined by a continuous increase in production rate over the years.



**Figure 1. Production increase at the Rusal Aughinish refinery.**

This production increase has been achieved with significant improvements in other key efficiencies. Energy consumption will serve as an example.



**Figure 2. Total energy consumption reduction at the Rusal Aughinish refinery.**

that the “designer” would give us a better and breakthrough solution to the challenge. As it was design led, it resulted in prototyping solutions, many interactive discussions, evaluations but always with the operator as the core customer.

Thirdly, we tackled one Department at a time. The next department could then use the learning from the previous department. This was in line with both participation and continuous improvement.

Fourthly, we pushed for standardised designs but allowed for local innovations.

Finally, the project was Gemba based, allowing testing of solutions in the plant before final adoption. This resulted in a high level of ownership by the operators.

An engaged workforce coupled with good technical and information availability and a continuous improvement ethic is a solid base for future performance. The presentation at the conference provides a visual history of the project over a period of over 12 months. It covers three departments with photographs showing the operator rooms before and after the project. It also includes a similar collection of photographs for a number of support department rooms.

The presentation provides a case study for the operator room in Port Department. It shows the prototyping, design work as well as before and after photographs in order to give an insight into the design work involved.

## **9. Conclusions**

AAL plant performance is entrusted to plant operators. Various Systems (especially IT based) are in place to aid the operator. Yet too often knowledge to do the job is hidden, poorly shared, unclear or misunderstood. Infrastructure can greatly hinder or greatly aid better communication.

A breakthrough improvement is possible in where and how the information is shared and communication occurs by developing a major improvement in daily management using visualisation.

We employed a design-led approach with the operator as the customer to implement Visual Daily Management in operator rooms in the AAL plant. This has enabled us to make information more open and communication clearer in a simple, standardised and visualised way to compliment other systems (especially IT systems).

This approach certainly leads to improved plant reliability and cost effectiveness by reducing errors and accidents through clarity of information and improved understanding.

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