# ERG's Practical Experiences Implementing Large Odour Control Projects

July 2020[1]

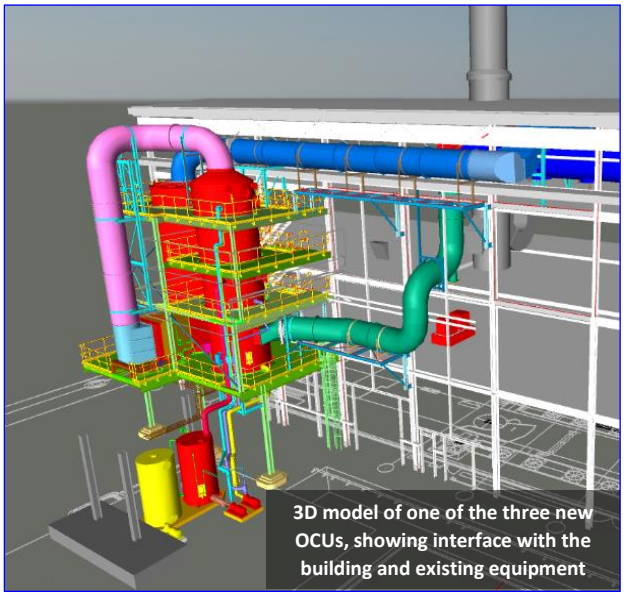
## Introduction

This brief paper reviews several key characteristics of successfully implemented large Odour Control projects. It is written to offer pointers for end-users and main contractors when planning, specifying and procuring new Odour Control schemes. The principles described in this paper are especially applicable for upgrade and enhancement projects on existing sites, for example where new processes are being added, old OCU equipment is no longer serviceable, or where tighter odour discharge standards are now required.

## Case Studies

Although the concepts described here are drawn from many years' experience across a large variety of projects in the waste water, municipal waste, food and pet food industries, to help illustrate the points we will focus on just three recent projects. In each case, ERG provided the design and engineering, project management, manufacture, installation and commissioning of the systems. All the projects described below had a contract value to ERG over £1M.

- **Case Study 1: Major UK pet food manufacturer**
  At this UK pet food manufacturer, the existing production facility required significant upgrade to the odour control provision due to increased and modified production requirements driven by the business and a need to replace existing odour control equipment at the end of its service life. ERG is providing three separate odour control packages with phased installation to minimise production downtime.

  
  3D model of one of the three new OCUs, showing interface with the building and existing equipment

  Each odour control unit comprises two stage scrubbing using bisulphite and caustic in tray and packed tower scrubbers for particulate, acid gas and odorous VOC removal, followed by carbon polish to achieve the odour discharge requirements (99.4% odour removal).

  The project challenges included complex design integration of the OCU (Odour Control Unit) packages within the existing (tight) site constraints, manufacture of large scrubber and carbon filter vessels, and safe installation of the packages with programmed shut-downs of the production lines. It is a 24-month programme with installation underway in Q2-Q4 of 2020.

[1] Paper presented at AquaEnviro on-line conference "Practical Experiences of Odour Management", July 2020, by Richard Hanson, ERG Managing Director.

- **Case Study 2: Urban STW in Sussex**
  Southern Water engaged in a major upgrade to the odour control at this sewage treatment site due to a new housing development close to the boundary of the Works. ERG provided a new main OCU to replace some of the existing odour extraction and treatment, while retaining some of the newer OCU equipment. ERG performed a significant optioneering exercise in conjunction with the main contractor and Southern Water to achieve a scheme offering best value, maximised use of existing assets, and capacity for future expansion. This demanding project was implemented within an extremely tight timeframe and included significant temporary and enabling works to permit safe installation of the OCU system.


New OCU at urban STW in Sussex

  The new main OCU comprises a bio-trickling filter and carbon filter polish to achieve the odour discharge of 1,000 $ou_E/m^3$ with all equipment drawn from ERG's standardised range to Southern Water and WIMES standards. ERG completed this project in early 2020.

- **Case Study 3: Significant Upgrade to Underground Inlet Works**
  Due to an updated DSEAR assessment, the ventilation and extraction from this underground sewage inlet works needed to be more than doubled. This site in a city on the south coast is surrounded by residential apartments and no interruption to extraction and treatment of the odorous air from the Works was possible while ERG installed the new ductwork, scrubbing package, fans and chemical storage. Here again, ERG designed and installed significant temporary ventilation and odour control to permit safe working and secure odour treatment during the installation phase.


New ERG OCU in existing building serving the Underground inlet works

  This project included the removal of redundant scrubbing equipment and installation of new, larger OCU equipment within an existing odour control building and reuse of an existing stack repurposed for more than double the design air flowrate. The project was completed successfully in 2016.

## Project Specification and Planning

Clearly an important part of every project, ERG's experience is that projects go well when we are involved early in the planning, allowing our input as a specialist odour control contractor. In particular, we find this is often best achieved with a FEED (Front End Engineering Design) contract, and in some circumstances pilot trials can also be beneficial. Specific areas where we add value to the project include:

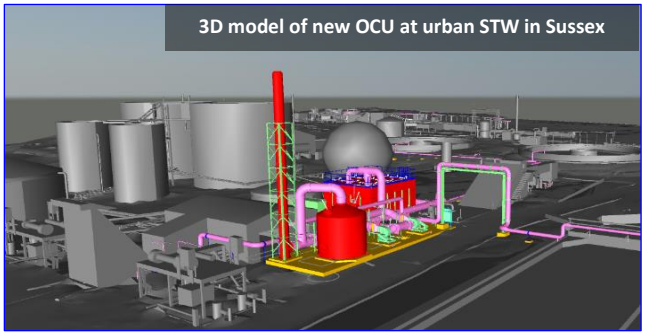
- **Defining the most suitable treatment technology**
  Frequently the required treatment steps are clear from a well-defined process design specification. However, this is not always the case. ERG owns several pilot plants which we use for trials to establish the most suitable treatment approach for a specific application. Working with site measurements and GCMS/olfactometry data from specialist labs, we can determine and report on the most suitable treatment technology.

  
  ERG's packed tower and carbon filter pilot plants

  And as a contractor with first-hand understanding of the technology implementation costs, we provide a BAT appraisal with whole-life cost comparisons – as we did for each of the examples above. This approach also allows ERG to offer performance guarantees for the new system.

- **Agreeing the optimised treatment scheme**
  Sewage treatment and food manufacturing sites routinely have multiple odour sources and existing odour control equipment. There is always a drive to obtain best value from existing OCU assets and understand the implications of including, or not, various parts of the client's process in the odour treatment scheme. At these three sites, ERG's professional process and design engineers provided optioneering reports with outline designs, costs and recommendations to allow the site owners to agree the ideal odour control solution for them.

- **Developing the 3D BIM model**
  3D modelling of the proposed system has several well-known advantages, including
  - A visualisation of the plant for all stakeholders
  - Determining the civils, structural and mechanical interfaces with existing structures and equipment
  - Allowing the piping and installation scope to be properly defined and limit the possibility of cost escalation in these traditionally high-risk areas.

  
  3D model of new OCU at urban STW in Sussex

  ERG's experienced 3D CAD team provided detailed modelling on the case study projects with all the benefits listed above.

- **Planning the installation phases and temporary works**
  A crucial aspect of planning each project is to fully identify the process, M&E and controls implications of the installation phase on the client's operations. At each of the three sites described above, ERG's team of designers and planners worked with the wider project team and site operations to ensure the timing of break-ins to existing services, connections to new and re-tasked process equipment, and sectional commissioning was properly assessed and planned, including the need for temporary ventilation, extraction and odour treatment.

  For example, at the case study 3 site, comprehensive ventilation was provided underground during the full installation period to ensure a safe atmosphere for the client's operators and ERG's installation crew to work, and the change-over between temporary and permanent equipment in the OCU building was achieved with just two short shut-downs – all by careful design and programme planning.

## Project implementation and installation

As a specialist odour control contractor, ERG's scope to does not stop with good planning and design. This section summarises three important features of successfully implemented, large Odour projects – during the supply, installation and commissioning phase.

- **Manufacturing large process vessels**
  ERG is vertically integrated with our plastic/GRP fabrication company. For each of the case study schemes, a key part of their success was the timely, in-house manufacture of high-quality vessels and ductwork.


Delivery of a large chemical scrubber, similar to case study 1 vessels

- **Project control**
  When the procurement, programme management and Health & Safety planning all go smoothly, no-one notices. When they don't, everyone notices!

  A key part of making a success of the projects described in the case studies, and many more besides, is getting these critical activities right first time, every time. ERG's project delivery team ensure our successful projects happen as planned – and this means employing experienced and qualified project and site managers and engineers, installers and H&S specialists.

- **Safe installation – enabling and temporary works**
  ERG acted as CDM Principal Contractor for two of the case study projects, with full responsibility for the worksite H&S. Although it is more usual for us to work under a Main Contractor, we have the capacity to manage this way of working, and for the example projects controlled the works comfortably since the majority of the activities within the worksite were carried out by ERG staff or direct sub-contractors.

Temporary odour control at case study 2 site

  Temporary ventilation and odour treatment are important to guarantee a safe working environment, particularly within enclosed buildings, and to limit fugitive odour emissions from the site – helping to ensure the site complies with permitted emissions even during the installation period.

## Summary

Selection of the right technology, thoughtful integration of the new OCU with existing or upgraded processes, and safe management of the installation all contribute to the successful implementation of a new Odour Control Scheme. ERG's proven track record in all these areas makes us a good choice for the most challenging projects.

**More information from**

**ERG (Air Pollution Control) Ltd**
Enterprise House, Foundry Lane, Horsham, West Sussex, RH13 5PX
www.ergapc.co.uk tel: 01403 221000