RJM's recent customers include:

- A dual-fuel burner was conceived, designed, and developed in-house by RJM's team of combustion engineers and has been awarded the prestigious Innovation Award by the UK's Energy Institute for its ground-breaking product.
- In 2015, RJM was awarded the prestigious Innovation Award by the UK's Energy Institute for its ground-breaking product.
- SO23 8AT, located in Winchester, Hants, Parchment Street, Kingdon's Yard, United Kingdom, offers its comprehensive range of combustion-related support services, RJM now offers a newly-developed safety system verification.
- RJM International is one of the world's leading, specialist provider of a range of innovative and technologically-sophisticated products and services aimed at the power and industrial plant sectors.
- To date, RJM has delivered over 60,000 MWe of low NOx and particulates and carbon.
- RJM works in partnership with some of the world's leading emmissions reduction specialists, providing hardware and analytical services to power generators and large utility supply companies and other large combustion plant.
- RJM's one-stop safety offer can yield efficiency improvements that reduce costs and increase profitability.

SAFETY

PLANT RISK ASSESSMENT : SAFETY SYSTEM VERIFICATION : FURNACE SAFETY & PROTECTION SYSTEMS : SAFETY REVIEWS : SAFETY AUDITS : RISK MITIGATION : BEST PRACTICE COMPLIANCE

RESOLVING COMPLEX EMISSIONS CHALLENGES FOR COAL, OIL, GAS AND BIOMASS-FIRED PLANT THROUGH THE APPLICATION OF COST-EFFECTIVE, INNOVATIVE SOLUTIONS
resolving complex emissions challenges for coal, oil, gas and biomass-fired plant through the application of cost-effective, innovative solutions

SAFETY

PLANT RISK ASSESSMENT : SAFETY SYSTEM VERIFICATION : FURNACE SAFETY & PROTECTION SYSTEMS : SAFETY REVIEWS : SAFETY AUDITS : RISK MITIGATION : BEST PRACTICE COMPLIANCE

Safety, Environment and Efficiency are inter-linked. Safety and Environmental compliance are both mandated by law but offer the advantage that when executed correctly, can yield Efficiency improvements that reduce costs and increase profitability.

In response to a growing demand from utility clients seeking a single provider capable of delivering the most comprehensive range of combustion-related support services, RJM now offers a newly-developed safety competence that addresses fuel and combustion safety concerns and ensures compliance with all local and national legislation.

The top priority for every plant manager – and one enshrined in law – is to ensure that the plant operates as safely as is practicable. Not only must the health and safety of all employees and visitors to the site be ensured, but there is also a duty placed upon the plant manager to ensure the facility is operating safely in relation to the local community.

With large amounts of combustible material on site - whether gas, oil, coal or biomass - a common feature across thermal-fired power stations and other large combustion plant is that a critical safety failure has the potential to develop into an extremely dangerous situation very quickly. In addition, secondary issues around emissions to air and water, noise, vehicle movements, chemicals handling and processing also have important health and safety implications.

To provide a single, end-to-end safety offer that takes into account every aspect of fuel handling and use, RJM has developed a set of benchmarked procedures that meet or exceed industry best practice and can be used to demonstrate compliance with all the latest legislation. In addition, these procedures have been designed to be third-party audited, so that plant owners can meet both internal compliance and external corporate risk requirements.

RJM’s one stop safety offer

RJM International is one of the world’s leading emissions reduction specialists, providing hardware and analytical services to power generators and large combustion plant.

In addition to its comprehensive safety offer, RJM is a leading, specialist provider of a range of innovative and technologically-sophisticated products and services aimed at the power and industrial plant sectors.

RJM’s recent customers include:

CUSTOMER SHOULD

Operate a safe plant

Meet all international, national and local Health & Safety and Environmental regulations

Pursue excellence in operational safety

Adhere to a clearly defined and well-managed risk strategy

Put in place support to establish causes and develop a strategy for future avoidance

RJM’S OFFER

SAFETY

Carry out operational and design risk assessment, safety case development and safety audit to mitigate all risks

COMPLIANCE

Measure key performance criteria and develop upgrade programme to ensure full compliance

BEST PRACTICE

Establish knowledge transfer to ensure plant operates to the highest industry performance levels

Develop training programmes to ensure best practice is maintained

RISK

Implement hazard investigation and risk mitigation procedures for new and existing plant

INCIDENT INVESTIGATION AND RESOLUTION

Execute incident investigation, complete safety audit and develop revised operational procedures

Adhere to a clearly defined and well-managed risk strategy

Pursue excellence in operational safety

Carry out operational and design risk assessment, safety case development and safety audit to mitigate all risks

Meet all international, national and local Health & Safety and Environmental regulations

Put in place support to establish causes and develop a strategy for future avoidance

Operate a safe plant
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Safety, Environment and Efficiency are inter-linked. Safety and Environmental compliance are both mandated by law but offer the advantage that when executed correctly, can yield Efficiency improvements that reduce costs and increase profitability.
The Safety System Requirements of New Plant

With the next generation of Combined Cycle Gas Turbines (CCGT) power stations in planning, plus the fleet of stand-by diesel generators that are now being installed as grid back-up, there is a mandated legal requirement for a full safety assessment across every aspect of their design and operation.

RJM is fully cognisant of and adheres to all the latest legislation and safety standards, including DSEAR / ATEX; NFPA 85; EN 298; ISO 21789; BSEN 61508; BSEN 60079-10-1/2 and all other gas detection and fire detection standards.

Explosion Protection - Special Requirements for Gas Turbines

Modern CCGTs operate with high pressure natural gas, and in addition to hazards associated with handling such fuels, there are special requirements for the gas turbine itself, set out in International Standard ISO 21789.

RJM’s Safety Expertise

As an active participant in the thermal-fired generation sector, with global plant efficiency improvements and Ultra-Low NOx Burner upgrade references now totalling over 60,000MWe, RJM has considerable expertise across all aspects of the combustion process as it relates to health and safety, including:

- Specialist fuel knowledge
- Specialist fuel processing knowledge
- Milling plant operation and behaviour
- Dust explosion risk and control
- Furnace protection and Burner Management
- System assessment
- High pressure gas systems
- Gas Turbine Enclosure safety cases
- Use of CFD in safety case development
- Risk mitigation techniques
- Flame monitoring
- Safety integrity levels.

RJM’s professional engineering resource includes specialists in fuel properties and characterisation, as well as safety specialists with many years’ experience in both design and operation of thermal-fired power plant. RJM’s engineers have been intimately involved in many challenging and unique projects, including equipment retrofits, new-build CCGTs and coal-to-biomass conversions. RJM’s specialists have also worked closely with the HSE and have authored and presented a number of technical papers focusing on safety at international conferences.

This standard requires a specific assessment of the ability of the gas turbine enclosure ventilation system to dilute foreseeable gas leaks to a safe level. For large gas turbines, this assessment requires Computational Fluid Dynamic (CFD) analysis as well as site-specific evaluation. RJM’s engineers worked with the UK’s Health & Safety Executive (HSE) to develop the requirements for these assessments; in addition, RJM has the in-house capability to carry out the CFD modelling.
THE CHANGING THERMAL-FIRED LANDSCAPE

A combination of increased commercial pressures and a requirement to reduce emissions has resulted in many thermal-fired plants having to reconfigure their processes quite substantially.

Tackling NOx emissions through ‘bolt-on’ SCR or SNCR reduction measures; introducing a wider fuel diet yielding different combustion and emissions properties; firing new fuels such as co-firing coal with oil, gas or biomass; even moving over fully to 100% biomass fuel are all material changes that demand a statutory re-assessment and review of all plant safety materials handling, safety systems and safety procedures.

Training & Awareness

RJM safety training packages ensure staff awareness of all safety issues and the importance of good practice. Safety training modules are tailored to suit each plant and can be undertaken on-site or at RJM’s offices.

In addition, the introduction of biomass onto a coal-fired plant brings with it an increased risk of fire, explosion and other potential health issues, such as respiratory illnesses caused by airborne spores. Again this is regarded as a material change that needs to be evaluated and recorded, with new safety procedures put in place to satisfy the additional risk factors.
Case-study: Independent Safety Review for RWE Npower, Tilbury

Following the biomass bunker fire at Tilbury Power Station in 2012, RJM was contracted to provide an independent review of the DSEAR risk assessments and the furnace protection system. These reviews were an important element of the station’s return to service following reconstruction of the bunkerhouse. RJM’s review included evaluation of the suitability of documented assessments and an assessment of site operation, including meetings with operations personnel. The study also drew upon RJM’s in-depth experience of biomass fuels and the company’s considerable prior knowledge of the workings of Tilbury Power Station.

Case-study: Risk Assessment for EDF Energy, East London CHP Units

In 2013, EDF Energy contracted RJM to carry out assessments at two of its CHP plants against the requirements of the Dangerous Substances and Explosive Atmospheres Regulations. Both plants were gas-fired and comprised a number of small boilers and gas engines. The scope of work included provision of risk assessments associated with the use of gas, together with hazardous area assessments. The scope also included staff training and guidance in regard to the ongoing maintenance of gas safety.

Case-study: Furnace Safety Review for New-Build Coal-Fired Power Plant in the Far East

RJM was contracted to carry out a review of the suitability of the furnace protection concept and functionality of the Burner Management System (BMS) at a new-build, coal-fired station following a number of boiler trip incidents. This review was carried out against the requirements of NFPA 85 but also considered the implications of the design of the flame monitoring system. RJM’s review made a number of significant safety recommendations.
In addition to its comprehensive safety offer, RJM is a leading, specialist provider of a range of innovative and technologically-sophisticated products and services aimed at the power and industrial plant sectors.

RJM works in partnership with some of the world’s leading utility supply companies and other large combustion plant, helping them operate as efficiently and as cost-effectively as possible, whilst meeting the latest emissions regulations, in particular those relating to emissions of SOx, NOx, particulates and carbon.

In 2015, RJM was awarded the prestigious Innovation Award by the UK’s Energy Institute for its ground-breaking coal and biomass-fired Ultra-Low NOx Burner. This new dual-fuel burner was conceived, designed and developed in-house by RJM’s team of combustion engineers and its adoption is now enabling thermal-fired plants to simultaneously reduce NOx and reduce their carbon emissions, through the introduction of co-firing with biomass fuel.

To date, RJM has delivered over 60,000MWe of low NOx reduction projects and is currently working with power generators in the UK, Europe, Asia and North America.

RJM’s recent customers include:

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