
Fact Sheet

Objective

Fouling of heat exchangers in refining industry crude oil preheat trains is a chronic operating problem that reduces heat transfer and energy recovery in these systems costing the industry $4.5 billion per annum. Eight percent of industrial plant operating costs may be attributed to heat exchanger fouling. Despite enormous costs associated with fouling, the industry relies on off-line cleaning because there are no on-line systems capable of operating under high temperature, low velocity conditions with chemically reactive fluids. The cost of taking plant off-line inevitably means that the heat exchanger operates at significantly less than peak efficiency. Our proposed solution is to develop an innovative projectile based on-line cleaning and injection system that will work under the required operating conditions to mitigate foulant build-up throughout the heat exchanger. Achieving our objectives will require
research to formulate accurate correlations of foulant deposition rate as a function of geometry and operating conditions, the development of a composite projectile material to achieve the required mechanical properties and chemical stability as well as a projectile trajectory control system to deliver a uniform distribution of projectiles over the heat exchanger tube-face. Furthermore; ensuring that projectiles are propelled through the heat exchanger tubes in a low velocity regime will require us to devise a means to temporarily increase flow velocity through selected heat exchanger tubes. Research will concentrate on characterizing foulant deposition mechanism, structure and rate, projectile tribology as well as gaining a detailed understanding of heat exchanger fluid flow and its control. The proposed solution will provide the industry with significant energy savings of over 10% and reduce the CO2 footprint across a wide range of industrial sectors.

Field of science

/engineering and technology/environmental engineering/energy and fuels/fossil energy/gas
/natural sciences/mathematics/pure mathematics/geometry
/engineering and technology/environmental engineering/waste management/energy recovery
/engineering and technology/mechanical engineering/tribology
/engineering and technology/environmental engineering/waste management/energy efficiency

Programme(s)

Topic(s)

Call for proposal

FP7-ENERGY-2008-1

Funding Scheme

CP - Collaborative project (generic)

Coordinator

THE UK INTELLIGENT SYSTEMS RESEARCH INSTITUTE LIMITED

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Activity type
Private for-profit entities
(excluding Higher or Secondary Education Establishments)

EU contribution
€ 736 007
# Participants (4)

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Country</th>
<th>EU Contribution</th>
<th>Address</th>
<th>Activity Type</th>
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