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A multiscale-multifunctional approach to advanced diagnosis and operator performance in complex process systems

Approved

Project Title

2007 : \$ 57,000

2008 : \$ 118,000

2009 : \$ 115,000

2010 : \$ 54,000

Primary RFCD 2906 CHEMICAL ENGINEERING

APA(I) Award(s): 1

Collaborating/Partner Organisation(s)

BlueScope Steel Ltd

BP Refinery (Bulwer Island) Pty Ltd

The University of Queensland

Synopsis

Major industrial accidents such as the Longford and Olympic Dam fires and explosions cost industry in Australia millions of dollars a year and possibly billions over the long term. Accidents lead to major safety, environmental, and business impacts. This project proposes an integrated approach to process diagnosis based on a novel multiscale-multifunctional framework. It will develop new blended hazard identification methods that generate deep understanding of complex processes that then inform advanced multiagent diagnostic systems and novel operator interface designs. Partnering with two major Australian companies, we aim to deliver significant improvements in abnormal condition management with major safety, environment, and economic impacts.

Impact statement

Major process system failures and subsequent poor diagnosis continues to produce significant company disruption, environmental damage, injury and possible loss of life. The benefits of this work will be reduced impacts and risks. This work will provide a new integrated approach with structured tools and diagnostic designs for process industries. It should have direct impacts on company performance through improved diagnosis, more timely response and hence reduced likelihood of major accidents. It will help to improve overall risk management practice in the process industries with less impact on people, property and environment, thus improving operational performance. Local communities will be direct beneficiaries of these reduced risks.