

MARKET ALARMING and ALERTING

by



Market Monitoring and Messaging Software System

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Background

Energy market conditions are prone to rapid change – market prices evolve at a frightening pace, plant conditions can change in an instant and opportunities can appear and evaporate almost without notice.

It is vital for organizations with exposures to the energy markets or with energy trading capabilities to maintain a watching eye on the myriad conditions which impact the portfolio.

Profit-making opportunities, cost minimization actions and risk mitigation controls arise under all of the following market events:

- High or low spot price
- High pre-dispatch price indicators
- Generator unit tripped
- Electricity loads exceeding thresholds
- Market bids are non-conforming
- Insufficient gas pressure

Furthermore, it may be useful to send periodical summary data to traders and other interested parties.

The Energy Edge Alarming and Alerting software system performs a continuous monitor on various market and portfolio data. The system enables an operator to configure triggers to deliver SMS messages and emails to people with smart phones in response to specific market conditions at predetermined times or on demand.

Capabilities

General

The Alarming and Alerting system contains a highly configurable software package to engage in two-way communications with key energy trading and risk managers.

Data source configuration: Configure the system to deliver messages on the basis of various database conditions: MMS Electricity, STTM Gas, or other portfolio databases

Trigger configuration: Configure the rules which will trigger messages to be sent, and configure the message itself

User configuration: Configure which users and groups receive which messages.

Two-way communications: Send a SMS or email request to the server to request it to deliver various market condition data back to your smart phone.

Ultimate Flexibility: Completely configurable data dependencies messages and alert trigger conditions through the system administrator.

Trigger and Message Configuration

The Alerting and Alarming system operates on configurable Rules to establish the trigger conditions to invoke a message, or to stop sending the messages.

The rules contain information such as:

- The predefined message to issue to users
- Each rule set has the following elements, configured by the administrator/user:
 - One or more rules
 - A message title
 - User group(s) who will receive the message
 - Hysteresis condition (that is, an option to suppress additional messages if the issue persists but a message has already been sent)
 - Enablement or disablement of the rule

The rule sets themselves can be built in a compounding manner to create logical structures of “rules upon rules”

The Alert is sent if the rule set is:

- Enabled
- Hysteresis satisfied
- All rules match
- Has valid recipients

Inbound Messages

Users can also request data through a SMS message sent to the server:

- Request current market data
- Request current predispatch prices
- Request current gas status
- Request who is the duty trader
- Request, run and deliver stored procedure based messages

A user can add custom inbound messages.

To invoke the request, a user simply sends a particular message to the server using SMS or email. The system responds with the relevant data at an instant.

If the message is unknown, the system responds with list of valid commands to prompt the user.

Additional actions can be delivered by sending messages to the server from your smart phone (or other computer), for example:

- Send a message to the server to set duty trader to a new person
- Send a message to the server to updates member of Duty Trader group
- Send a message to the server to diverts trading phone to new duty trader mobile number

Illustrations

Action Management

Name	Checked	Last Sent	Hysteresis	Independent Rules	Enabled		
Market Data	3d 20h 30m	34d 21h 51m	1 Hours	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	Select
High Spot Price	3d 20h 30m	3d 20h 30m	1 Seconds	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	Select
Non Conforming Bid	3d 20h 30m	34d 23h 47m	1 Hours	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	Select
Predispatch Price	3d 20h 29m	34d 21h 57m	1 Hours	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	Select
Dispatch Changing	3d 20h 29m	34d 23h 44m	1 Hours	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	Select
Gas Status Action	3d 20h 29m	34d 23h 50m	1 Hours	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	Select
Generic Action Service	2d 18h 56m	2d 18h 56m	2 Minutes	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	Select
Dispatch Mode	3d 20h 29m	32d 3h 53m	8 Seconds	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Edit	Select

Market Data - Last invoked 15/08/2011 12:37:32 PM (34d 21h 51m ago)

Rule Set Meta Data

Enabled

Message Title

Rule Set Hysteresis

Hysteresis Units

Merit Order

[Update meta data](#)

Rules

Variable	Operator	Value	Generation		
Predispatch Sequence No	less than	18	1	Edit	Delete
Predispatch Sequence No	greater than or equal to	18	0	Edit	Delete
Predispatch Sequence No	less than	21	0	Edit	Delete

[add rule](#) [delete this group](#)

Subscribers

Group	Subscribed	
User	<input type="checkbox"/>	Edit
Trader	<input type="checkbox"/>	Edit
OnCall Trader	<input type="checkbox"/>	Edit
Backup Trader	<input type="checkbox"/>	Edit
Administrator	<input checked="" type="checkbox"/>	Edit

Figure 1 – Screen shot of the application to configure actions

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Market Data                                Predispatch Price
Time QldRRP Meter1 Meter2 Meter3          28 Jun 2011, 10:46
1330 $22.64 115 __0 __0                    QLDRRP MW
1335 $23.16 115 __0 __0                    1050 $30.65 155D
1400 $23.15 115 __0 __0                    1130 $31.77 156
                                           1200 $30.65 155
                                           1230 $80.34 155
                                           1300 $85.01 155
                                           1330 $95.01 155
    
```

Figure 2 – Sample SMS message displays

Architecture

The Alerting system is implemented using several components.

- A Windows service that monitors the state and sends alerts in response to state changes
- A SQL Server database to manage the state of the system
- A web application to view and manage the state of the application
- An SMS Gateway (third party) to forward the alerts to users
- The MMS or other market databases as a data source

The following diagram illustrates the separate components.

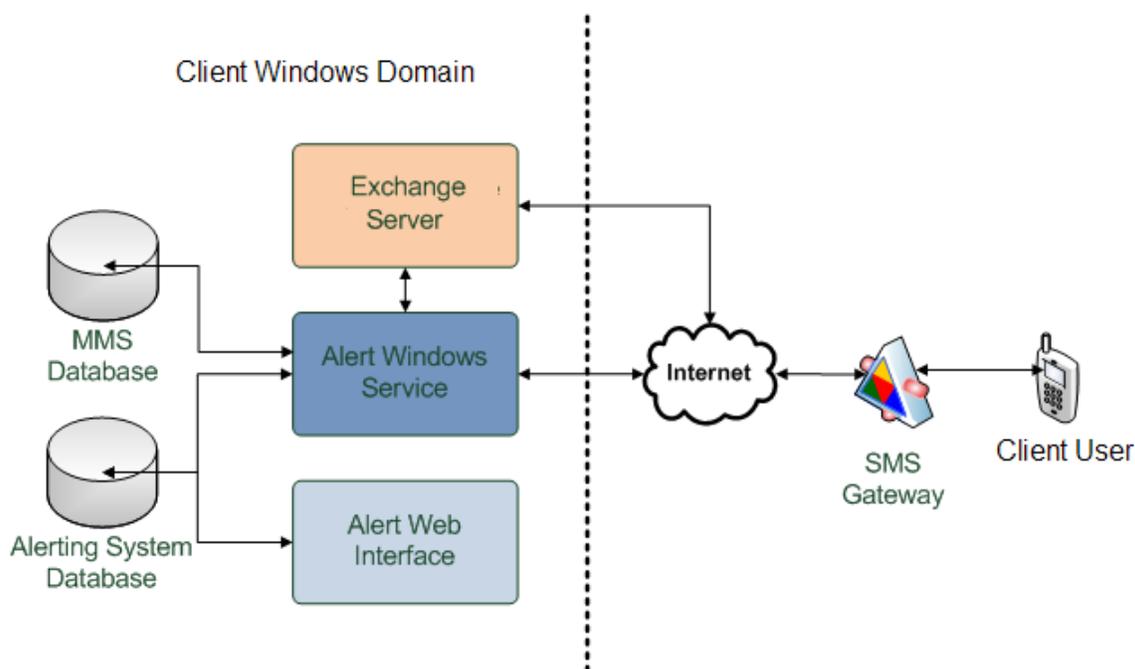


Figure 3 - System Components

More Information

For more information on the Alarming and Alerting product or Energy Edge's other services visit www.energyedge.com.au or alternatively phone Angus on 0419 739 260 or send an email to amacleod@energyedge.com.au

Energy Edge Fact Sheet

Energy Edge is an innovative consulting organisation that specialises in commercial and market risk management services and business activities. Energy Edge helps clients in utilities to meet their needs for managing commercial and market risk, trading requirements and exposures to environmental and energy costs.

The Energy Edge team has a combination of financial and commodity market experience through the full spectrum of trading and risk management areas, commercial and corporate finance activities. This breadth and depth of experience combined with extremely strong commercial, analytical, mathematical and software development skills forms the base from which Energy Edge provides a range of consultancy services to entities directly and indirectly impacted by energy, environmental and other commodity markets.

Recent Projects: Some recent projects undertaken by Energy Edge include

- Designing, developing and implementing pricing and risk management software tools in energy markets
- Developing and installing contract management software for urban water market settlement and invoicing
- Implementation, design, configuration and testing of third party software across front office, middle office and back office processes
- Designing and developing electricity price benchmarking tools and transfer pricing processes
- Commercialization strategies and feasibility studies for gas and gas generation projects
- Due diligence work for major utility acquisitions
- Valuation of real options embedded in gas supply agreements
- Enterprise wide reviews of carbon risk and opportunities
- Policy and procedure reviews and
- Delivery of a trader and risk manager decision support suite of software tools Market Edge, based on specific Energy Edge intellectual property.

Trading and market risk management

- Trading strategy development
- Portfolio optimisation
- Training
- Market research and surveys
- Policy development and reviews
- Risk identification and measurement services

Commercial Advice

- Assistance in due diligence processes
- Assistance in business plan development
- Analysis of commercial implications arising from regulatory or market changes
- Competitor analysis under different market structure scenarios
- Enterprise Wide Services

- Treasury risk management services
- Assistance to Internal audit teams
- Fitness for full retail competition
- Review of business risks and their correlations with other markets
- Development and implementation of Trading and Risk Management functions for emerging energy companies

Systems and Software

- Development and installation of a Water Contract Management system.
- Development and implementation of customised analytical and pricing tools
- Development and installation of the Energy Edge proprietary trading and risk management software *Market Edge*.
- Project management of systems and software projects
- Retrospective documentation, standardisation and process management for ad-hoc in-house systems and tools.

Environmental Markets

- Market structure advice
- Policy advice
- Modeling of environmental markets, price forecasts and assessment of commercial implications
- Assistance in registration and accreditation processes
- Environmental product strategy development
- Enterprise wide carbon risk assessments and management planning

Biographies of key personnel

- **Angus Macleod**, Managing Director

Angus has over eight years experience in the Australian energy markets in roles establishing electricity trading desks and managing trading operations. His experience has spanned market trading activities and managing large commercial negotiations and projects. He was elected Chairman of the AFMA Electricity Committee in 2005 and 2006. Angus has experience in front and middle office roles across a range of markets including base metals, precious metals, foreign exchange, equity and interest rate markets. He has a further seven years experience in domestic and international financial and commodity markets and over four years as an auditor for Deloitte

In the role of Managing Director of Energy Edge since June 2006, Angus has lead a team to provide a wide array of clients with high quality advice and solutions across electricity, gas and environmental trading and risk management issues.

- **Elliot Tonkes**, Director Risk and Analytics

Elliot is an experienced analyst with background in commercial and academic environments. He has experience in energy markets as the chief analyst at a major generator leading small teams to perform forecasting, risk quantification, pricing and analysis of derivatives and structured financial products, strategy evaluation, project valuation, system development and software implementation.

As Director of Risk and Analytics at Energy Edge since September 2006, Elliot has provided high quality advice to analysts, and implemented solutions for a range of risk



management issues in electricity trading. Elliot has overseen substantial IT system implementations of complex analytical methods.

■ **Stephen Clapham, Lead Technical Consultant**

Stephen is a highly experienced IT professional with expertise in IT development and systems analysis. Stephen has experience across a range of industries including logistics and the Queensland urban water market. He has developed complex real-time scheduling systems and web-based retail systems across a range of languages and technologies.

As the Lead Technical Consultant at Energy Edge, Stephen ensures quality IT solutions are provided to clients with value for money and in under a managed framework to keep clients informed at all times.

■ **Other team members**

Other members of the Energy Edge team can be found at the website:
www.energyedge.com.au

More Information

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