

Onto the Grid

Power Trading & Scheduling Come Together

An in-depth look at OpenLink's pMotion Power Scheduling and Logistics System and ESS – OpenLink's European Scheduling System

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The convergence of the physical and financial sides of the energy markets is changing the traditional roles of traders and schedulers and the IT systems required to handle this new market dynamic.

While the trader is still responsible for trading at volume, the scheduler is (partly) becoming a real-time trader. Independent from the opening hours of a trading floor, schedulers must be able to make instant scheduling and short-term trading decisions to ensure that balancing requirements are met and schedules adhere to gate closing times – with a direct impact on trading portfolios. This means that both disciplines must be able to interact in a real-time manner.

The decisions a trader makes by hedging or structuring a portfolio could be jeopardised by the decisions a scheduler makes if the two are not effectively connected. A trader will try to close or hedge their position in a way that is optimal for the portfolio from a pure financial and risk perspective. A scheduler's main purpose is to balance and schedule the physical delivery to avoid bottlenecks and penalties.

With that in mind, it becomes a must that the trader and scheduler are using an integrated system which avoids discrepancies between the trading and scheduling position and connects their activities in as risk free and efficient a way as possible.

US Scheduling

OpenLink developed and introduced pMotion, its front-to-back logistics system for the US electricity markets, in 2003. It is fully integrated with Endur, OpenLink's energy trading and risk management (ETRM) solution for the energy and commodity markets. When used in conjunction with Endur, pMotion allows traders, risk managers, back office users and schedulers to use and share one unique set of transactional data across the entire organisation. The whole life cycle of physical transactions from trade capture,

pricing, valuation, confirmation, invoicing, position monitoring, scheduling, settlements and adjustments can now be managed in one integrated ETRM and logistic system.

Fundamental pMotion Features for US Scheduling:

- 1. Real-Time Trade Notification.** When a trader or a scheduler commits to a deal or an existing deal is amended, everyone within the company with an interest in this action is automatically notified in real-time. With the straight through processing environment provided by Endur and pMotion, all of the functional groups within an organisation are capable of viewing the same unique set of real time data.
- 2. Real-Time Position, Scheduling, Risk Monitoring and Accounting.** This framework allows traders to analyse and keep track of positions in real-time, schedulers to track and manage unscheduled positions and to monitor and act on scheduled positions subject to Transmission Loading Relief – the set of policies enacted by the National Electric Reliability Commission (NERC) in the US. The framework also allows risk analysts to monitor positions and limits, credit analysts to check and monitor counterparty exposures in real-time and back office staff to process payments accounting for actual scheduled and delivered volumes and prices.
- 3. Auto-Bookout Functionality.** The auto-bookout functionality of pMotion allows for the quick identification and management of direct bookouts (all physical deals that can be settled financially with direct counterparties). Monthly and daily bookouts, direct and indirect, can be identified and agreed upon with counterparties upstream and downstream and executed prior to scheduling activities. Once this is done, the remaining physical positions can be matched and scheduled using the user

friendly querying and matching functionality of pMotion, accounting for rules specific to each market. Multiple concurrent schedulers can utilise pMotion simultaneously, each one focusing on a specific region/market, with the filters and configurations of their screens matching the requirements of their market.

- 4. Flexible Position Display Criteria.** Users have the ability to easily retrieve and display positions using a variety of grouping criteria typically used by schedulers: by control area, location, counterparty or block of standard power product. Once displayed in the match management screen of pMotion, users can easily sort or filter the positions to focus on any subset of the data.

- 5. Visually Locate Deals that Need to be Matched.** An hourly screen allows the user to see both the current unscheduled volume and the proposed volume to be matched for any group of deals selected on an hour by hour granularity. These user friendly functionalities allow for the easy selection of deals that need to be matched. Upstream and/or downstream paths can be easily linked to bookout and schedule for example, through the copying and pasting of data from excel, comments can be captured and new trades can be booked to meet any requirements of the real-time market.

- 6. Match Trades with Transmission Contracts Across Multiple ISOs.** Scheduling across multiple control areas or ISOs is facilitated by easy-to-use matching functionality, allowing users to match purchases and sales trades with the required transmission contracts. pMotion can handle both physical and financial losses for transmission as required by a Control Area or transmission provider. If desired, the complete set of data in any one screen of pMotion can be easily exported to

excel, via copy and paste or a couple of mouse clicks, allowing schedulers to further analyse or report on it using a familiar spreadsheet format.

7. Manage Real-Time Schedule Changes.

After schedules are initially created, submitted and e-tagged in an external schedule, pMotion provides extensive capabilities to easily manage real-time schedule changes, including schedule cut or curtailment arising from generation, transmission, load outages, re-supply of a schedule or re-sink of a schedule. In the current version of pMotion the e-tagging of a schedule is done using any third party e-tag application.

8. **Synchronise e-Tagged Schedules.** The complete data model for e-tag has been implemented in Endur as per the latest NERC e-tag specification and a fully functional e-tag graphical user interface (GUI) is available. This makes it easy and simple to import and match schedules created in pMotion with e-tags created externally. Once they are linked, it is possible to keep them in sync by triggering an update to a schedule in pMotion when a change occurs in the corresponding e-tag.

9. **Communicate Easily with ISOs/RTOs Through OpenLink's Power Market Gateway API.** Currently, bi-directional communications between Endur/pMotion and all ISOs/RTOs are facilitated by the use of an OpenLink standard interface API (PMG) with a third party ISO communication application. Using this interface and the third party application, schedulers using pMotion can submit schedules automatically to ISOs once they are created in pMotion, monitor the status of the submission, submit offer and bids, automate the booking of the awards as trades in Endur, download locational marginal price prices in Endur curves, and download ISOs/RTOs settlements in Endur.

European Scheduling

All regions have special requirements. The increasing volumes within the European electricity market require an adequate and

reliable Electronic Data Interchange (EDI) between all market participants.

Although Europe pushed for the introduction of a unified standard for data exchange based on the European Transmission System Operators (ETSO) protocol, different implementations of this standard and other protocols still exist (XML based ETSO protocols in Germany, Austria, Switzerland, Luxembourg, Czech Republic, Slovakia, France and EDIFACT-based protocols in France and The Netherlands).

To assist with the interchange across borders, OpenLink developed the OpenLink *European Scheduling System* (ESS) application based on these standards. The ESS application encompasses multiple processes, covering different stages of a typical business cycle of a power trading organisation.

Fundamental European Scheduling System Features:

1. **Reduce Operational Risk.** To ensure the same level of interoperability within European markets, OpenLink's ESS application is also fully integrated into Endur. All information necessary to facilitate the balancing and to create the schedules is stored in the Endur database. With that, it has become possible to minimise the operational risk between the trading and the scheduling departments.

2. **Automatic Balancing.** Within the European market a Balance Responsible Party (BRP) has to balance its Balance Circles (BC) in each control area. The ESS Balancing Module automatically balances out open physical power positions in certain BCs and control areas. The existing open positions are closed by transmitting them to another BC. The corresponding deals are booked into Endur. By doing this step by step in a hub-spoke fashion (starting from the control area with the longest distance from the own control area), all open positions are finally transmitted to the company's own control area. The companies owning power production units finally close these open positions in their home control area.

3. **Easily Communicate with Transmission System Operators (TSOs).** To facilitate communication with external parties, aggregated schedules in ESS format can be generated for all relevant TSOs. All versions of the schedules are saved to the Schedule Database. The complete version management for messages and time series is covered by this module.

4. **Automatically Generate Schedule Messages.** Following the ESS role-model, a BRP nominates the power flows from its BCs in each control area to the assigned Balance Coordinators or System Operators. The Nomination Generation Module generates the schedule messages representing the power flows described above. Usually, the generation of schedules is carried out after balancing has been finalised.

5. **Check Schedules Against Known Profile Data.** Throughout the whole nomination process, the ESS Application supports the version management for time series and messages as required by the ESS role-model. To allow the scheduler to control their work, the ESS application provides a preview of created schedules. This way, schedules can be manually checked on plausibility and against known profile data. Schedules can be modified at this point.

With the availability of scheduling applications such as pMotion and ESS which are natively integrated with Endur as an intrinsic component, operational risks arising from the intricacies of managing physical obligations in power markets with different scheduling requirements and rules are kept at a minimum.

Schedulers using pMotion or ESS at any type of institution (regulated utilities, merchant generation companies, retailers, banks, hedge funds and marketers) can be confident that they will be able to manage all their physical positions with delivery obligations in an accurate and timely manner. ■

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