



Commander

(Start-up and shutdown solutions for combined cycle plants)

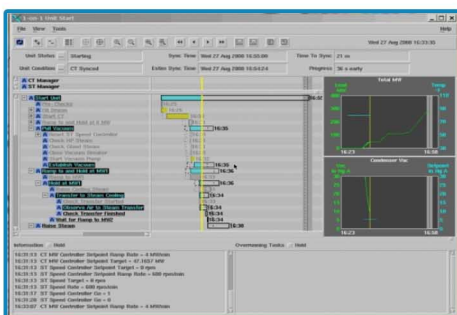
How do you guarantee a repeatable great start for your combined cycle plant? What does your recovery start profile look like if your steam turbine has a sudden trip? How fast can you locate start issues, correct them, begin where you left off, and allow the trader to update the new plan submitted to the market? How can you make sure every start or stop reduces plant damage?

Real Time Power introduces our flagship Commander product line. Our start-up solution was first developed in 2001 for planning and automating coal fired plant startups in real time to reduce plant damage. In 2005, we specifically developed a version for combined cycle plants and in 2008 we added the shutdown planning and automation.

There are three modules included in Commander product line: Advisor, Automator, and Trader.

Commander Advisor

This base module is installed at the plant level and reads hundreds of tags from the plant DCS. The start-up or shutdown is broken down into steps in a Gantt Chart format and allows the



operator to follow the procedure and real time status for a great start every time. Also, the operator sees tasks that are not happening or running over the allotted amount of time and sees what corrective issues need to happen. Using this module will pinpoint all the start-up and shutdown deviation issues encountered that prevent a perfect start.

Commander Automator

An add-on to the Advisor module, this solution offers real time closed loop feedback that gives the most consistent starts and stops by controlling the entire start-up or shutdown while the operator focuses on the stubborn or manual parts of the plant. The system will allow anywhere from some automation to full automation. Additionally, the operator can take control anytime, force tasks to completion, or even recover from a failed start. Every start or stop result is saved for later review, metric analysis, or training.



Real Time Power, Inc

22503 Katy Freeway
Katy, Texas 77450

Office +1 (281) 994-4245

Fax +1 (281) 994-4246

email: sales@rtpsys.com

Commander Trader

Trader is an add-on to the Automator or Advisor module and allows the trader to study various start-up or shutdown profiles and instantly communicate it to the plant via the network. Furthermore, the start-up or shutdown will adhere and optimize to the local market rules and provide all necessary tag values. The trader initiates the desired start-up or shutdown profile and the plant approves it. If you have the Automator installed, the start-up or shutdown will initiate automatically at the scheduled time.



Good Advice for Plant Operators

Commander Advisor provides an overview of the MW profile leading up to a pre-determined handover time, which the operator follows manually. Using the software, the operator can construct the optimal MW profile which is calculated using the plant specific configuration tables. Without Advisor the operator knows that he has to meet the handover MW at the handover time, for example, 300 MW at 7am, but he is operating without a profile. In so doing, he could damage the plant or start generating MWs too early which cannot be sold, but cost money in terms of fuel and CO2 emissions. Advisor provides the experienced operator both an optimized and achievable MW start-up profile to follow to ensure a successful handover, while trainees can leverage Commander's detailed step-by-step procedures and real time feedback to significantly reduce errors.

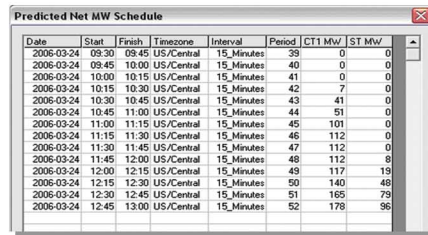
Automation That Creates Value

With Automator, Commander will drive the plant automatically according to the selected start-up profile. Using Advisor, the operator has to manually control the ramp rates and hold times on the profile while Automator does this automatically. For this reason, Automator avoids slippage of the plan whereas Advisor requires the operator to keep the plan on time.

Automator executes the start up mechanism to guarantee an achievable optimal MW profile, typically within +/- 15MW. An operator can automate all or part of the plan and Commander provides a real time view of the start up progress towards handover, highlighting start slippage and any plant issues. This approach frees up operating staff to deal with plant equipment or other issues rather than concentrating on just implementing the start MW profile. However, if the plant gets into a situation where schedule slippage has occurred, the operator can make a value judgement as to where to catch up in the plan, based on the real time status feedback of Commander, whereas, when doing it manually it is hard to know whether he is on time, ahead or slipping, and furthermore, what to do about it. Commander's flexibility will also allow the operator to force parts of the plant to start early as a means of catching up and addressing slippage issues.

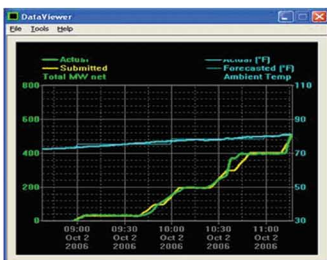
A Solution Your Traders Will Love

Traders love Commander because they are able to confidently bid and trust in the fact that the plant will deliver the MWs committed to the market during a start-up or shutdown. Without the software, the Real Time Desk would phone the plant operator and ask how long it would take to reach a generating level of 300MW and basically draw a straight line from 0-300MW covering this period. By combining temperature forecasts, plant thermodynamic states, and local market rule information, Commander creates an achievable and market compliant continuously variable plan which gives both the trader and plant operator all necessary information to meet the specified handover time and MW. As a result, Commander can execute start ups at minimal fuel costs and reduced generation error. This same reasoning holds true for shutdowns as well.

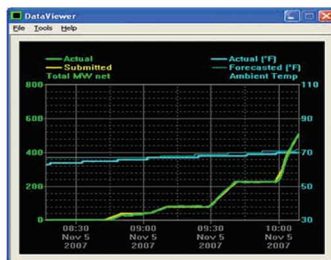


Date	Start	Finish	Timezone	Interval	Period	CT1 MW	ST MW
2006-03-24	09:30	09:45	US/Central	15_Minutes	38	0	0
2006-03-24	09:45	10:00	US/Central	15_Minutes	40	0	0
2006-03-24	10:00	10:15	US/Central	15_Minutes	41	0	0
2006-03-24	10:15	10:30	US/Central	15_Minutes	42	7	0
2006-03-24	10:30	10:45	US/Central	15_Minutes	43	41	0
2006-03-24	10:45	11:00	US/Central	15_Minutes	44	51	0
2006-03-24	11:00	11:15	US/Central	15_Minutes	45	101	0
2006-03-24	11:15	11:30	US/Central	15_Minutes	46	112	0
2006-03-24	11:30	11:45	US/Central	15_Minutes	47	112	0
2006-03-24	11:45	12:00	US/Central	15_Minutes	48	112	8
2006-03-24	12:00	12:15	US/Central	15_Minutes	49	117	19
2006-03-24	12:15	12:30	US/Central	15_Minutes	50	140	48
2006-03-24	12:30	12:45	US/Central	15_Minutes	51	165	79
2006-03-24	12:45	13:00	US/Central	15_Minutes	52	178	96

Another feature traders will love is the user-friendly graphic interface which makes it easy to carry out predictive calculations and simulate different start-up and shutdown scenarios, even going from a 1-on-1 configuration to 2-on-1 and vice versa. Commander also provides a set of economic tools to evaluate potential profitable handover times and automatically computes predicted and actual costs per start when combined with the current price of electricity.



Manual Start-up



Commander Automator Start-up