

MIRA
Black Start User Guide

Monitoring Analytics, LLC

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MIRA Black Start User Guide

The Black Start module in MIRA calculates the black start revenue requirements for qualified black start resources, and supports communication between the IMM and Market Participants (MP) to reach agreement on the appropriate levels of calculation inputs.

Black start revenue requirements for black start units consist of fixed black start service costs, variable black start service costs, training costs, fuel storage costs, and an incentive factor. Section 18 of Schedule 6A of the OATT specifies how to calculate each component of the revenue requirement formula. Black start resources can choose to recover fixed costs under a formula rate based on zonal Net CONE and unit ICAP rating, a cost recovery rate based on incremental black start NERC-CIP compliance capital costs, or a cost recovery rate based on incremental black start equipment capital costs.

This User Guide describes the functionality and workflow in the MIRA Black Start module. For information about the Member Information Reporting Application (MIRA), please see the MIRA Users Guide on the Monitoring Analytics “Tools” page:

<http://www.monitoringanalytics.com/tools/tools.shtml>.

1 Getting Started with the Black Start Module

1.1 Black Start User Permissions

To get access to the Black Start module in MIRA, have your company’s Customer Account Manager (CAM) create a MIRA account, and grant you the Black Start User role. For details on CAM responsibilities, please see the CAM Quick Start Reference on the “Tools” page.

The Black Start User role can be assigned by checking the “Black Start User” box in the user profile:

Company	User Types				Actions
Demo Company	<input type="checkbox"/> Account Manager	<input checked="" type="checkbox"/> Black Start User	<input type="checkbox"/> Company User	<input type="checkbox"/> Fuel Policy User	
	<input type="checkbox"/> RPM/ACR User	<input type="checkbox"/> Power Plant Operations User (continuous)	<input type="checkbox"/> Power Plant Operations User (monthly)		

To submit black start revenue requirement data for a qualified black start resource in the Black Start module in MIRA, please contact the IMM at mira@monitoringanalytics.com.

1.2 Access to MIRA Black Start Module

When logged in to the MIRA system, with Black Start User account permissions, access the Black Start module by clicking on the “Black Start Data Management” link under “Reporting” in the Menu Bar.



2 Black Start Data Management Screen

When a user arrives at the Black Start Resource Data Management screen, they should: (1) confirm that the Delivery Year is displaying the correct delivery year, and (2) confirm that all expected Black Start Resources for the selected company are displayed. If any resources are missing, please contact the IMM at mira@monitoringanalytics.com. Next, observe the workflow status (3). If the workflow status is "IMM Data Not Loaded", the record is not yet ready for a user to edit the record, and the "Edit" button (4) will be inactive. When the "Edit" button is activated for a resource, the user can open the record and submit Black Start input data, or change the workflow status, which will be described in the following sections.

Market participants can use the user interface in the Black Start Resource Data Management screen to enter their data individually for each unit, or upload an Excel file with data for multiple black start resources (see Section 5 Import/Export.)

Monitoring Analytics MIRA Member Information Reporting Application

Demo Company Black Start Resource Data Management Demo User

Main Menu Reporting Sign Out

Delivery Year * 2016/2017 Export Import Copy Inputs from Prior Delivery Year

Records Per Page: 12 (1 of 1)

Black Start Resource Name	Access Type	Calculated Black Start Revenue	Calculation Method	Workflow Status	Actions
Demo Black Start Resource 1	All Access	\$9,876.90	BFR	Ready for MP Input	Edit
Demo Black Start Resource 2	All Access	\$58,283.03	NERC	Ready for MP Input	Edit
Demo Black Start Resource 3	All Access			IMM Data Not Loaded	Edit

Records Per Page: 12 (1 of 1) 3 records

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3 Black Start Resource Data Management (For a Specific Resource)

When the user clicks the “Edit” button in item (4), a variation of the following screen is presented. The different variations of the screen will depend on the calculation method input by the IMM (See item (5).) To change the calculation method for a given resource, contact the IMM at mira@monitoringanalytics.com.

3.1 Black Start Revenue Requirement Calculation Methods

The following are screen shots of what the Black Start Resource Data Management screen will look like for each of the calculation methods. For details and data definitions of each of the calculation methods, see Section 18 of Schedule 6A of the OATT.

The IMM may contact the market participant to request supporting information.

3.1.1 Base Formula Rate (BFR)

Most Black Start resources revenue requirements are calculated with the Base Formula Rate (BFR) method. Note:

- 1) Confirm that you are editing the correct resource by checking the name in the screen header. In the screen shot, it is editing the resource named “Demo Black Start Resource 1.”
- 2) The calculation method is set as “BFR” and the workflow status is currently at “Ready for MP Input.” For more information on the workflow, please see section 4, Workflow Status.

- 3) Note the coloring of the cells. Green cells are populated with IMM data. White cells, displayed with “Enter Value” are where market participant users should enter data inputs. Yellow fields are calculated subtotals and totals, based on the IMM and user inputs.

The screenshot displays the 'Black Start Resource Data Management' interface for 'Demo Black Start Resource 1'. The interface is divided into several sections:

- Unit Information:** Includes fields for Zone (COMED), Unit Type (CT), Unit ID (DEMO1), and Unit Name (Demo Black Start Resou).
- Variable Costs:** Includes Y (Allocation Factor) (0.01), O & M (\$/year) (Enter Value), and VBSSCC (\$) (\$0.00).
- Training Costs:** Includes Training Costs (\$) (\$123,456.00), Resources per Plant (Enter Value), and TBSSCC (\$) (\$0.00).
- Fuel Storage Costs:** Includes Run Hours (2,000.00), MTSL (Minimum Tank Suction Level) (Enter Value), Bond Rate (%) (7.00%), Fuel Burn Rate (Enter Value), Fuel Cost (Commodity Fwd)(\$/gal) (Enter Value), Fuel Handling (Basis)(\$/gal) (Enter Value), and FBSBSCC (\$) (\$0.00).
- Fixed Costs:** Includes Net CONE Area, Net CONE (\$/MW-day) (\$123.00), Delivery Year Days (0-365) (365), Capacity (MW) (10.00), X (Allocation Factor) (0.02), and FBSBSCC (\$) (\$8,976.00).
- Adjusted Final:** Includes IMM Adjustment (\$) and IMM Adjustment Description.
- Final Cost Per Unit (\$/year):** (\$6,976.00).

Red annotations highlight specific features: '1' points to the resource name; '2' points to the 'Unit Type' field; '3' points to a group of 'Enter Value' input fields for O & M, Training Costs, and Fuel Storage Costs.

3.1.2 Capital Recovery Factor (CRF)

The CRF calculation method differs from the BFR calculation method in that fixed costs are based on a capital cost and capital recovery factor instead of a net CONE allocation.

Demo Company | Black Start Resource Data Management for (Demo Black Start Resource 2) | Demo User

Main Menu | Reporting | Sign Out

Back to Resources | Delivery Year: 20162017 | Calculation Method: CRF | Workflow Status: Ready for MP Input | Confirm | Acknowledge Disagreement | Save | Submit | Undo

Unit Information	
Zone	COMED
Unit ID	DEMO2
Unit Type	CT
Unit Name	Demo Black Start Resou
Variable Costs	
Y (Allocation Factor)	0.01
O & M (\$/year)	Enter Value
VBSSCC (\$)	\$0.00
Training Costs	
Training Costs (\$)	\$12,345.00
Resources per Plant	Enter Value
TBSSCC (\$)	\$0.00
Fuel Storage Costs	
Run Hours	2,500.00
MTSL (Minimum Tank Suction Level)	Enter Value
Bond Rate (%)	0.07%
Fuel Burn Rate	Enter Value
Fuel Cost (Commodity Fwd) (\$/gal)	Enter Value
Fuel Handling (Basis)/(\$gal)	Enter Value
FSBSSCC (\$)	\$0.00
Fixed Costs	
Capital Costs	Enter Value
CRF	Enter Value
FBSSCC (\$)	\$0.00
Adjusted Final	
IMM Adjustment (\$)	Enter Value
IMM Adjustment Description	Enter Value
Final Cost Per Unit (\$/year)	\$0.00

3.1.3 NERC

The NERC calculation method differs from the BFR and CRF calculation methods in that fixed costs are based on both the net CONE allocation as well as a NERC-CIP capital cost and capital recovery factor.

Demo Company | Black Start Resource Data Management for (Demo Black Start Resource 2) | Demo User

Main Menu | Reporting | Sign Out

Back to Resources | Delivery Year: 20162017 | Calculation Method: NERC | Workflow Status: Ready for MP Input | Confirm | Acknowledge Disagreement | Save | Submit | Undo

Unit Information			
Zone	COMED	Unit Type	CT
Unit ID	DEMO2	Unit Name	Demo Black Start Resou
Variable Costs			
Y (Allocation Factor)	0.01	O & M (\$/year)	Enter Value
VBSSCC (\$)	\$0.00		
Training Costs			
Training Costs (\$)	\$12,345.00	Resources per Plant	Enter Value
TBSSCC (\$)	\$0.00		
Fuel Storage Costs			
Run Hours	2,500.00	MTSL (Minimum Tank Suction Level)	Enter Value
Bond Rate (%)	0.07%	Fuel Burn Rate	Enter Value
		Fuel Cost (Commodity Fwd)(\$/gal)	Enter Value
		Fuel Handling (Basis)(\$/gal)	Enter Value
FSBSSCC (\$)	\$0.00		
Fixed Costs			
Net CONE Area		NERC-CIP Capital Costs	\$123,456.00
Net CONE (\$/MW-day)	\$123.00	NERC-CIP CRF	0.3830
Delivery Year Days (0-366)	365	Yearly NERC-CIP	\$44,514.53
Capacity (MW)	15.00		
X (Allocation Factor)	0.02		
FBSSCC (\$)	\$13,488.50		
Adjusted Final			
IMM Adjustment (\$)			
IMM Adjustment Description			
Final Cost Per Unit (\$/year)	\$69,293.03		

3.1.4 FERC

The FERC calculation method is a black start revenue requirement value that has been approved specifically for this resource by FERC.

Demo Company | Black Start Resource Data Management for (Demo Black Start Resource 2) | Demo User

Main Menu | Reporting | Sign Out

Back to Resources | Delivery Year: 20162017 | Calculation Method: FERC | Workflow Status: Ready for MP Input | Confirm | Acknowledge Disagreement | Save | Submit | Undo

Unit Information			
Zone	COMED	Unit Type	CT
Unit ID	DEMO2	Unit Name	Demo Black Start Resou
		FERC Rate (\$/year)	
Adjusted Final			
IMM Adjustment (\$)			
IMM Adjustment Description			
Final Cost Per Unit (\$/year)	\$0.00		

3.2 IMM Alternative Values

The IMM will review the data submitted by market participants and may request supporting documentation or explanation. When the IMM disagrees with a market participant on the value of one of the user inputs, the IMM will use an IMM alternative value field to communicate the IMM value. These fields only display in the screens when the IMM has populated them.

Note that the IMM alternative values are also accompanied by subtotals and a final fixed cost value (IMM Calculated Final Cost), which are based on the IMM data and the market participant input data, and only use the IMM alternative data as an alternative to the market participant input data where the IMM alternative data exists.

The screenshot displays the 'Black Start Resource Data Management' interface for 'Demo Black Start Resource 2'. The interface includes a navigation menu, a reporting dropdown, and a 'Main Menu' section. The current workflow status is 'Ready for MP Input'. The data is organized into several sections:

- Unit Information:** Zone (COMED), Unit Type (CT), Unit ID (DEMO2), Unit Name (Demo Black Start Resou).
- Variable Costs:** Y (Allocation Factor) (0.01), O & M (\$/year) (Enter Value), IMM O & M Value (\$1,111.00), VBSSCC (\$) (\$0.00), IMM Calculated VBSSCC (\$) (\$11.11).
- Training Costs:** Training Costs (\$) (\$12,345.00), Resources per Plant (Enter Value), IMM Resources per Plant Value (2), TBSSCC (\$) (\$0.00), IMM Calculated TBSSCC (\$) (\$6,172.50).
- Fuel Storage Costs:** Run Hours (2,500.00), MTSL (Minimum Tank Suction Level) (Enter Value), IMM MTSL Value (3,333.0), Bond Rate (%) (0.07%), Fuel Burn Rate (Enter Value), IMM Fuel Burn Rate Value (4.0), Fuel Cost (Commodity Fwd)(\$/gal) (Enter Value), IMM Fuel Cost Value (\$5.550), Fuel Handling (Basis)(\$/gal) (Enter Value), IMM Fuel Handling Value (\$0.060), FBSBSCC (\$) (\$0.00), IMM Calculated FBSBSCC (\$) (\$57.98).
- Fixed Costs:** Net CONE Area, Net CONE (\$/MW-day) (\$123.00), Delivery Year Days (0-365) (365), Capacity (MW) (15.00), X (Allocation Factor) (0.02), FBSSCC (\$) (\$13,498.50).
- Adjusted Final:** IMM Adjustment (\$), IMM Adjustment Description, Final Cost Per Unit (\$/year) (\$14,815.35), IMM Calculated Final Cost (\$/year) (\$21,051.08).

Red brackets in the image highlight the 'IMM Calculated' values for Variable Costs, Fuel Storage Costs, and Final Cost, indicating where the IMM has populated alternative values.

4 Workflow Status

The purpose of the Black Start module workflow is to support communications that allow the market participant and IMM to confirm a final value. The workflow status is changed throughout the process by the IMM or market participant clicking on buttons, which are enabled and disabled depending on the current workflow status. At any time in the process, the

workflow status can be seen on the “Black Start Resource Data Management” screen (see item 1).

The different statuses of the Black Start workflow are:

- **IMM Data Not Loaded:** Before the IMM has loaded the calculation method and the IMM data, the market participant input screen for the resource cannot be opened.
- **Ready for MP Input:** When the IMM has selected and saved the calculation method for the resource, the market participant can open the Black Start Resource Data Management screen and enter and save their input data for that resource. At any step in the process, if the market participant determines that they wish to change any of their inputs, they can contact the IMM at mira@monitoringanalytics.com, and request that a resource workflow be reset to **Ready for MP Input**.
- **MP Inputs Saved:** When the market participant has changed any data, they must click on the **Save** button to commit those changes to the database (see item 2). When the market participant saves data changes before submitting, the workflow status changes to **MP Inputs Saved**.
- **MP Revenue Requirements Submitted:**¹ When the market participant has saved their input data, and wishes to submit the calculated revenue requirement cost to the IMM, the market participant clicks **Submit** (see item 3) and the workflow status changes to **MP Revenue Requirements Submitted**. When the inputs have been submitted, the record is locked to market participant edits pending IMM review.
- **IMM Reviewed - No Disagreement:** When the market participant submits their black start revenue requirement inputs, the workflow shifts to the IMM to review the submitted inputs. The IMM will review and may contact the market participant user who submitted the inputs to request supporting information. If, after reviewing the input and supporting data, the IMM does not disagree with any of the inputs, the IMM will so indicate, and the workflow status will be changed to **IMM Reviewed – No Disagreement**.
- **MP Confirmed:** When the IMM has set the status to **IMM Reviewed – No Disagreement**, the market participant can close the process for the resource by clicking on the **Confirm** button, which sets the status to **MP Confirmed** and locks the record to further editing by the market participant or IMM.²
- **IMM Reviewed – Disagreement:** When the market participant submits their black start revenue requirement inputs, the workflow shifts to the IMM to review the submitted

¹ If the market participant believes that there are errors in any of the IMM data or the revenue requirement calculation, the market participant should contact the IMM at mira@monitoringanalytics.com.

² If, after the market participant confirms, the IMM or the market participant wish to make changes, the IMM can reset the status to **Ready for MP Inputs** and restart the process.

inputs. The IMM will review and may contact the market participant user who submitted the inputs to request supporting information. If, after reviewing the input and supporting data, the IMM disagrees with any of the inputs, the IMM may contact the market participant directly to discuss the disagreement. The IMM may use the IMM Alternative fields in the Black Start Resource Data Management screen to communicate what the IMM believes are the appropriate values for any of the MP inputs. If the IMM and market participant cannot come to an agreement on the appropriate value for any of the inputs, the IMM will so indicate, and the workflow status will be actioned to **IMM Reviewed – Disagreement**.

- **MP Acknowledges Disagreement:** When the IMM has set the status to **IMM Reviewed – Disagreement**, the market participant can close the process for the resource by clicking on the **Acknowledge Disagreement** button, which sets the status to **MP Acknowledges Disagreement** and locks the record to further editing by the market participant or IMM.³ PJM will conduct its tariff compliance review, and if PJM approves the contested value as compliant with the tariff, the value will be included in rates as provided in the tariff and market rules. PJM's tariff compliance review is not a review of market power and PJM's acceptance of the value does not constitute a determination that the level of the value is acceptable. The participant shall continue to have exclusive responsibility for the cost input. The IMM may take action, including filing a FERC complaint under Section 206 or a referral as defined in the Market Monitoring Plan, in order to get a final determination on the IMM's market power concerns related the level of the submitted value.

³ If, after the market participant acknowledges the disagreement, the IMM or the market participant wish to make changes, the IMM can reset the status to **Ready for MP Inputs** and restart the process.

Back to Resources
Delivery Year: 20162017
Calculation Method: BFR
Workflow Status: MP Inputs Saved
Confirm
Acknowledge Disagreement
Save
Submit
Undo

Unit Information			
Zone	COMED	Unit Type	CT
Unit ID	DEMO1	Unit Name	Demo Black Start Res.
Variable Costs			
Y (Allocation Factor)	0.01	O & M (\$/year)	\$12,345.00
VBSSCC (\$)	\$123.45		
Training Costs			
Training Costs (\$)	\$123,456.00	Resources per Plant	2
TBSSCC (\$)	\$81,728.00		
Fuel Storage Costs			
Run Hours	2,000.00	MTSL (Minimum Tank Suction Level)	12,345.0
Bond Rate (%)	7.00%	Fuel Burn Rate	123.0
		Fuel Cost (Commodity Fwd) (\$/gal)	\$1.234
		Fuel Handling (Basis)/(\$gal)	\$1.234
FSBSSCC (\$)	\$44,831.88		
Fixed Costs			
Net CONE Area			
Net CONE (\$/MW-day)	\$123.00		
Delivery Year Days (0-365)	365		
Capacity (MW)	10.00		
X (Allocation Factor)	0.02		
FBSSCC (\$)	\$8,979.00		
Adjusted Final			
IMM Adjustment (\$)			
IMM Adjustment Description			
Final Cost Per Unit (\$/year)	\$127,008.35		

5 Import/Export

From the Black Start Resource Data Management screen, market participants can export and import Excel files that contain all of the IMM and market participant data. The exported file also contains the calculation logic. If a market participant intends to use a batch import of black start data, it is recommended that they generate the import file by using the Export function to create the template.

The columns of the export file are color coded to match the colors of the fields in the Black Start Resource Data Management user interface screen. Dark gray columns are used as section dividers (dividing variable costs from training costs from fuel storage costs from fixed costs.) Green columns are used for IMM data. Yellow columns are used for subtotal and total fields that are calculated by the spreadsheet. White columns with black border are used for market participant data entry.

The exported file includes five worksheet tabs, one for each calculation method (BFR, CRF, NERC, FERC, and Override.) The black start revenue requirement for each black start resource

will only appear on the worksheet for the calculation method that is currently assigned to that resource.

When importing, the import process only imports the data in the white market participant input fields. The IMM data and calculated data in the spreadsheet are not uploaded from this file. The calculation uses the IMM data that resides in the database, and calculates the subtotal and total fields based on the IMM data in the database.

6 Copy from Prior Delivery Year

If a market participant wishes to copy their black start revenue requirement input data from the prior delivery year to the current delivery year, they can use the “Copy Inputs from Prior Delivery Year” function.

Black Start Resource Name	Access Type	Calculated Black Start Revenue	Calculation Method	Workflow Status	Actions
Demo Black Start Resource 1	All Access	\$127,008.35	BFR	Ready for MP Input	Edit
Demo Black Start Resource 2	All Access	\$14,815.35	BFR	Ready for MP Input	Edit
Demo Black Start Resource 3	All Access			IMM Data Not Loaded	Edit

Clicking on the button presents a dialogue box from which the market participant selects the source delivery year from which to copy. Clicking on “Copy Inputs” completes the copy process.

Copy Inputs from Prior Delivery Year

2016/2017

Copy Inputs

The data will be copied from the prior delivery year if the workflow status for the resource is “Ready for MP Input” and if the calculation method from the source prior delivery year is the same as the calculation method for the target current delivery year. Resources that meet these criteria have their inputs copied. Resources that fail these criteria receive a message that the copy function for those resources has failed. If some resources pass the criteria and some fail,

the copy will succeed for those resources that pass and the copy will not be completed for those that trigger a warning.