




California ISO

EIM Track 4 Overview - Integration and Testing

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REVISION HISTORY

VERSION NO. <small>(Must match header)</small>	DATE	REVISED BY	DESCRIPTION
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1.1	6/26/2017	Lennon Werner, Susan; Strouse, Nancy	Updated template; Updated per Joanne's instructions.
1.2	1/28/2019	Alai, Joanne	Updated to reflect Day in the Life as 1 month
1.3	5/16/2019	Fattah, Ayman	Formatting and content updated based on lessons learnt
2.0	7/10/2021	Alai, Joanne; Strouse, Nancy	Updated to reflect more up-to-date processes based on lessons learned. Minor clarifications and formatting.



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1 Purpose

The purpose of this document is to provide entities who are joining the Energy Imbalance Market (EIM) with a summary of the various testing phases that occur as part of implementation. This document is intended for all ISO and new EIM entity team members involved in the testing phases.

2 EIM Testing Summary

The California ISO EIM implementation process includes several different testing phases to ensure that new integrations are functioning as designed, and that the Energy Imbalance Market runs successfully for the new and existing participants. The testing phases are included in Track 4 – System Integration and Testing, except for Parallel Operations, which is a pre-production final testing phase and considered part of the deployment process, not a track.


Phase	Start Time	Duration	Primary Objective	Where?	Who?
Connectivity Testing	Before T minus 8 months	2-4 weeks	New EIM Entity systems and users are able to access the ISO systems	Map Stage	Technical team
Joint Integration Testing	T minus 7 months	1-2 months	ISO systems available for EIM Entity initial integration testing	Map Stage	Technical team
Functional Integration Testing	T minus 6 months	2 months (overlaps w/DITL)	Technical validation of the EIM Entity and ISO software changes; SME training (month 2)	Map Stage	Technical team, with help from business SMEs
Day in the Life (DITL) Testing	T minus 5 months	1 month	EIM Entity business validation of the EIM; Run specific scenarios; SME hands on training	Map Stage	New EIM Entity Business SMEs, with help from technical team
Market Simulation	T minus 4 months	2 month (includes holiday)	ISO business validation of the EIM and other markets of current and new software functionality	Map Stage	New EIM Entity, ISO, Existing EIM participants and other ISO stakeholders
Parallel Operations	T minus 2 months	2 months	Certify Readiness (month 1) System Stability (month 2)	Stage	New EIM Entity and ISO only

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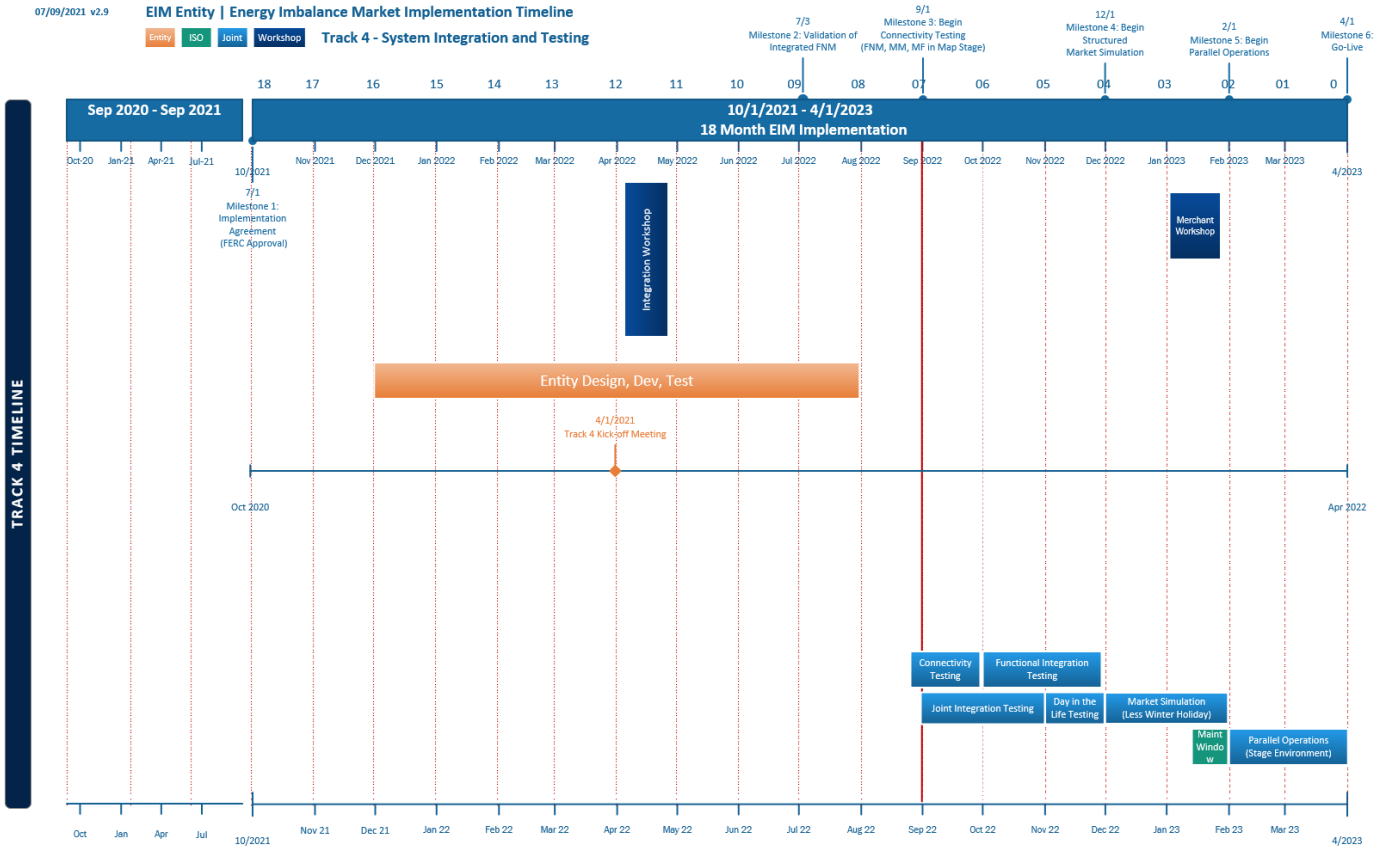
EIM Track 4 – System Integration and Testing kicks off once the new EIM entity determines their integration strategy and begins their design. The following meetings and workshops are key parts of the Testing process:


- **Track 4 weekly meetings** – These are the regular sync-up meetings between the ISO and the EIM entity’s teams participating in the system integration and testing work. Meetings kick off once the EIM entity’s design phase gets underway and the teams are identified.
- **Integration Workshop** – The integration workshop is a half-day virtual workshop to provide the EIM entity with an overview of the integration process to support their technical design. The ISO integration and testing lead presents details of each integration point and a preview of the testing phases to the EIM entity’s technical team. This meeting is best to occur once the EIM entity design team begins to get an understanding of the EIM environment and questions are being formed. EIM entity vendors are key participants.
- **Test Phase Reviews** – Prior to the start of Integration testing, Day in the Life Testing, and Market Simulation, the ISO will schedule a test phase review meeting. The objectives, processes, and necessary artifacts for each testing phase are reviewed to ensure the EIM entity is prepared for testing and that all questions and concerns are resolved. These can be covered in the regular Track 4 meetings or in a separate meeting if more time is needed.
- **Merchant Workshop** – Prior to the start of Parallel Operations, the ISO will conduct a full-day virtual workshop with the Merchant end users to discuss topics such as bidding concepts and strategies, Green House Gas (GHG) bidding in SIBR, ISO reports in ADS, CMRI, EMS and OASIS, Load Forecasts, and RTD infeasibility.

System specifications for the ISO internal systems can be found on the ISO public site.
<http://www.caiso.com/participate/Pages/ApplicationAccess/Default.aspx>

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3 EIM Timeline



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4 EIM Testing Phases

4.1 Connectivity Testing

Once a scheduling coordinator ID (SCID) has been assigned to the new the EIM entity and the necessary Scheduling coordinator agreements have been executed, the ISO can issue security certificates and the EIM entity can begin provisioning access to their testing users. Once users are provisioned, they can conduct initial connectivity testing by pinging each ISO system and verifying that an appropriate response is received. Both system and user access can be verified. This connectivity testing can begin before the Map Stage environment is available, before the environment is ready for integration testing with the integrated network model and master file. While the user may not be able to access the application at this point due to environment readiness, they will receive a response that indicates that their access is in place and they are through the fire wall.

Processes:

- The User Access Administrators (UAA) are identified in advance. The EIM entity UAAs will request and approve user access for both system and individual users. At least one primary and one backup UAA are required for both EIM entity and Merchant sides.
- UAAs need to submit access requests via the AIM system and ensure all users and systems have access before connectivity testing begins.
- Scheduling Coordinator EIM Entity Agreements must be in place, and SCIDs must be assigned.
- The EIM entity will attempt to access each application and provide a report to the CAISO team when their attempts are successful.

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MAP Stage

System	UI	API	Notes
WEBOMS			
ADS			
ALFS	NA		
BAAOP			
BSAP			
CMRI			
MF			
OASIS		NA	
SFTP Server*			
SIBR			
MRI-S – STLMT			
MRI-S – METER			
MPP		NA	

**not available until first settlement statement is published*


4.2 Joint Integration Testing

Joint Integration Testing is the first opportunity to verify the integration points between the ISO and the new EIM entity and their vendor. This testing phase is mostly a technical stage with validation focusing on the technical aspects of the integration and ensuring that payloads can be sent and received between the ISO and the EIM entity.

Before any integration testing can begin between the ISO and the new EIM entity, the ISO Map Stage Environment needs to be configured with the following:

- The EIM entity's network model integrated with the ISO full network model
- The EIM entity's resources configured into the ISO Master File, and
- The ISO market model configured based on these additions.

The above deliverables are required to meet the EIM entity's payment Milestone #3. Prior to this setup, the EIM entity must complete initial connectivity testing.

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Artifacts:

- **EIM From-To Diagram Detailed Spreadsheet** – Detailed list of each ISO/EIM entity integration point with a given E/C identifier. (This spreadsheet is customized for the EIM entity interfaces.)
- **EIM Testing Timeline Summary** – A timeline and testing status for each ISO/EIM entity integration point. Each EIM entity owns updating this artifact and reviewing it regularly in the Track 4 meeting. The completed Testing Timeline Summary will be used as evidence for several Readiness Criteria required for certification.
- **EIM Data Flow Diagram** – A high level overview of the expected integration points for new EIM entities.
- **CAISO System Inventory** – A list and description of all ISO systems that interface with the new EIM entity.

4.3 Functional Integration Testing

Functional Integration testing is where the EIM entity begins testing actual business functionality and running through business scenarios using test data. Business subject matter experts are typically brought in to assist the technical and testing teams to ensure all processes are considered.

Functional testing is primarily an EIM entity function and overlaps with Day in the Life testing. Once the systems are determined to be stable and processes are flowing, the ISO training team can conduct hands-on classroom training for EIM entity operators.

Key Artifact:

- **EIM Testing Timeline Summary** – The EIM entity continues to update this document throughout Functional testing.


4.4 Day in the Life Testing (DITL)

Day in the Life testing is a one-month period just prior to Market Simulation, when the new EIM entity needs to execute all EIM business processes, end-to-end/bid-to-bill, identified in the Day in the Life spreadsheet. Day in the Life testing is typically completed in parallel with the end of functional testing.

- Day in the Life is expected to begin five months before the Go-Live implementation date, allowing time for one month of Day in the Life testing, two months of Market Simulation, and two months of Parallel Operations.
- Settlement statements will be published once per week, per the pre-published settlement calendar.
- The EIM entity is expected to execute all applicable Day in the Life scenarios in the Day in the Life Readiness worksheet until all scenarios complete successfully in one day.
- Hands-on classroom training for operator end users can begin during this time, as the environment and systems should now be stable.

Entrance Criteria:

- Complete development and testing of all systems and interfaces during Joint Integration Testing. Individually passed and noted in the Testing Timeline Summary.

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Exit Criteria:


- Day in the Life Testing is considered complete when all scenarios have been executed for all documented time periods in the Day in the Life Readiness Worksheet. All scenarios must either pass or an exception must be documented.

Key Artifacts:


- **EIM Testing Timeline Summary** – The EIM entity continues to update this document during Day in the Life Testing.
- **Day in the Life Readiness Worksheet** – List of specific business functions, applicable to the EIM entity, by time period relative to the Trade Date (T-7 through T-1, T-75 through T-37.5, T-37.5 through T-5, TD+1 through TD+55B). (EIM Entity owns updating this – used as evidence for Readiness Criteria.)

4.4.1 Day in the Life Data Setup


Data Feed	Who Provides	Process	Automatic Submission Frequency	Notes
Load Forecast	CAISO	ALFS will provide hourly forecast at T-80 and T-60, to BSAP and capacity test; Ability to retrieve T-75, T-55, and T-40 load forecast from BSAP, balance the retrieved load forecast	Between T-80 and T-75, again between T-60 and T-45	Groundhog Day based on agreed TD.
Non-EIM ENTITY Base Schedules	CAISO	Canned data/Groundhog Day	every hour	System will be balanced. Will include: (masked/modified) CAISO Generation and EIM PR and NPRs appropriate to Selected TD. Intertie schedules pulled from WIT.
Non-EIM ENTITY Bids	CAISO	Canned data/Groundhog Day	Every hour	
Non-EIM ENTITY ETSRs	CAISO	Canned data/Groundhog Day	Submitted once to support entire simulation timeline	All Static / Dynamic limits. Will be constructed to allow flexibility for transfers.

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Data Feed	Who Provides	Process	Automatic Submission Frequency	Notes
EIM ENTITY Gen Base Schedules	EIM ENTITY	EIM entity will submit generation base schedule at T-75, T-55, and T-40 to BSAP	Once DA at 3pm for all 24 hours of TD. Modifiable in RT.	Balanced Base Schedules for all 24 hours. Auto push daily DA at 3pm from canned set. Modifiable in RT.
EIM ENTITY Intertie Base Schedules	EIM ENTITY	EIM entity will submit the approved and pending tags to inter tie base schedules to BSAP	After T-75 and before T-40	Balanced Base Schedules for all 24 hours. Auto push daily DA at 5pm from canned set. Modifiable in RT. Need to register for a tagging test bed user identification if they would like to simulate E-Tagging, if no E-Tag is submitted ISO will “auto tag” on your behalf, limit one registration per SCID.
Bids	EIM ENTITY	Merchant submitting participating resource bids	Before T-75	Bids will be for full unit available range with curves from low prices to high prices. Modifiable in RT.
Dynamic Limits	EIM ENTITY	Entity will submit hourly ETSR limits, static limits, and 5 minute dynamic for all ETSR through EIM Dynamic Limit interface to BAAOP	Every 5 minutes	Must submit every 5 minutes. ETSR and BG.
VER Forecast	EIM ENTITY	Entity will have the forecaster submit VER forecast every 5 minutes to ALFS	Every 5 minutes	Must submit in 5-minute increments at least 5 hours in the future.

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Data Feed	Who Provides	Process	Automatic Submission Frequency	Notes
Dispatches	EIM ENTITY	Entity will retrieve 5-minute dispatch for both participating and non-participating resources, and create interface to update EIM ENTITY EMS base point; Ability to retrieve from ADS every 5 minutes and adapter to update EIM ENTITY EMS base point	Every 5 minutes	Market Results for EIM Entity and Merchant to review and take action
Telemetry		Not applicable for Day in the Life and Market Simulation		Parallel Operations and Production Only
Outages	EIM ENTITY	Entity will submit approved outages		Auto push DA for all 24 hours. Modifiable in RT.
Meter Data	EIM ENTITY	Entity will submit meter data for total BA load, Tie, and Resources to MRI-S Meter as discussed in the Track 5 document		Once a day at T+1 days, updated as needed up to T+8 days when required for days when ISO has settlement calculations planned per settlement calendar as needed for those settlement scenarios
Settlements	CAISO	Calculates settlement statements during Day in the Life and Market Simulation per settlement calendar	None	Per settlement calendar established in EIM Track 5 Overview – Settlements document

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Data Feed	Who Provides	Process	Automatic Submission Frequency	Notes
RTSI – Pre-hour	EIM ENTITY	Entity will submit inter tie schedules every 5 minutes including cross interval ramping through RTSI interface	Every 5 minutes for rolling window of 50 minutes of the previous hour, up to end of next hour, with the last 2 intervals not ramped, in MW	
RTSI – After the Fact	EIM ENTITY	Entity will submit inter tie schedules and TG as AFTER THE FACT - does not include cross interval ramping through RTSI interface	None.	Once a day at T+1 days, updated as needed up to T+8 days, in MW as required for settlement scenarios

4.5 Market Simulation


The Market Simulation phase of the testing process provides an environment for ALL Market participants, not just the new EIM entities, to test their systems and procedures before new features are implemented. Market Simulation is conducted in the ISO Map Stage environment. The ISO and the EIM entity execute specific pre-defined scenarios to ensure that current system functionality and the market continues to work as designed. This includes several structured scenarios defined by the ISO and, optionally, unstructured scenarios defined by the EIM Entity. All structured and unstructured scenarios must execute successfully.

Market Simulation (two major phases):

- **Structured Simulation** – Bid-to-bill scenarios are executed with inputs and market conditions controlled by ISO, unless otherwise specified. New EIM entities will participate in the structured execution and meetings will be scheduled to coordinate execution.
- **Unstructured Simulation** – Optional Entity-defined scenarios deemed critical for go-live will be documented and executed. Coordination meetings may be scheduled, if necessary.

Entrance Criteria:

- Market Simulation begins four months prior to Go-Live implementation, allowing time for two months of Market Simulation, and two months of Parallel Operations.
- Full Network Model, Market Model, and Master File are in the Map Stage Environment.

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- All ISO and EIM entity integrations are functioning and connectivity has been established.
- All Day in the Life features have been executed successfully.
- All certificates and provisioning for Map Stage are complete for systems and individual users.

Exit Criteria:

- All documented structured and unstructured scenarios need to complete successfully or an explanation/mitigation provided as part of the readiness certification requirements. This includes settlement validation.


Market Simulation takes about 20 to 30 business days to complete for a new EIM entity, spans two months, and includes the following:

- Facilitates an effective market operations dress rehearsal for ISO and new EIM entities,
- Allows for system or procedural problem identification and mitigation before the market is operationally or financially binding,
- Enables market participants to observe the behavior of ISO systems and markets in a simulated production environment, particularly in regard to new functions and features introduced through the addition of the modifications included in the CAISO Release initiatives,
- Establishes confidence in the operational processes and systems associated with the new market functionality implementation,
- Provides a hands-on environment to allow participants to interact with new and unique features and functionality,
- Provides an environment where market participants can scrutinize and tailor their own tools, applications and business practices to participate in new market functionality,
- Provides a means of capturing additional market participant input and feedback regarding the implementation of the new market features and functionality, beyond what might have been received in the stakeholder process,
- Provides market participants the tools to help determine:
 - Proper exchange of market related data and validation of new timelines,
 - Common understanding of data submittal requirements and timelines, and
 - Familiarity with market rules and timelines.
- Provides an opportunity to verify the ISO Bid-to-bill process in a pre-production environment that includes simulated market and operational data inputs. This allows the market participants to verify systems, process, and procedures that may need modifying due to the functional changes tied to the release.

4.5.1 Market Simulation Data Setup

The ISO will set up the following during the scenario execution:

1. ISO is will use a production Trade Date (TD - date is to be determined) base case. ISO will augment this data with the relevant EIM data and use the TD’s bids as the base bid set. This


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will also include base schedules for EIM and demand forecast for non-EIM entities from WECC. Interchange Schedules will be pulled from WIT for this TD as well.

2. Based on the scenario specifics, ISO may seed Market Participant’s bids or allow the Market Participants to bid in whatever resources they see fit for the scenario.
3. All EIM Entities will need to balance during the timeframes identified in the scenario “Execution Time”, as well as provide the EIM Transfer Resource Limits.

The MAP Stage environment will be set up with specific application characteristics and data flows to foster successful simulation. These changes are made to facilitate a simulation and will not be implemented in Production.

- The ISO will upload a previous day’s production bid set for the Day Ahead Markets (DAM) by 10:00 PPT daily.
- Market participants can overwrite these bids between 10:00 PPT and 11:00 PPT when the DAM closes.
- DAM will close @ 11:00 PPT and the results will be published by 14:00 PPT daily, unless it is a Structured Scenario day. It may take the ISO longer to publish DAM due to Scenario setup and verification.
- Real Time (RT) template bids will be built from DAM awards as the standard process. ISO may also submit RT bids if it deems necessary.
- RT Bid markets for a specific Trade Date (TD) open automatically @ 11:00 PPT TD-1.
- Market participants are encouraged to bid into the Real Time Markets (RTM) to foster a more realistic simulation; the only exceptions are during structured scenario executions where identified.
- Market participants will need to register for a tagging test bed user identification if they would like to simulate E-Tagging, if no E-Tag is submitted ISO will “auto tag” on the EIM entity’s behalf. The limit is one registration per SCID.




Note: The timeframes for each Settlements statement publication period are different.

- Settlements timelines will be provided in the Market Simulation Settlement Calendar. There will be two Settlement Trade Dates per week during Market Simulation.

4.6 Parallel Operations

Beginning two months before EIM activation, the ISO will activate a Parallel Operation environment to practice production grade systems integration, as well as market processes and operating procedures in preparation for new EIM entity activation, and to confirm full compliance with metrics detailed in the EIM readiness criteria. The Parallel Operation consists of the following:

- ISO deployment to the Stage environment two months prior to Go-Live will act as a rehearsal for production deployment. A detailed deployment plan will be provided and followed.
- EIM Readiness Certification:

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- All readiness criteria must be met as a condition of certification.
- Certification is required 30 days prior to go live, and after a period of stable parallel operations.
- EIM Entity needs to successfully complete all structured scenarios from Market Simulation.
- Daily meetings will be scheduled to review and discuss parallel operations market results.

As part of the deployment to the Parallel Operations, production data is streamed to the Parallel Operations Stage environment with full EIM and FNM functionalities, but the market is financially non-binding for the two-month period. During this period, the EIM entity participates as an active EIM BAA on the Parallel Operations System, which streams its input from the live Production System. The Parallel Operations System will be accessible to the new EIM entity to submit base schedules, bids, outages, and other input data to ensure balance of base schedules, and successful feasibility tests, to the extent possible. The EIM entity will also collect EIM dispatch results, which are financially non-binding during this transition period of Parallel Operation. Operation of all IT interfaces, except the settlements, will be the same as planned for full activation of EIM tariff.


The EIM entity will perform typical production activities including issuing outages, operator manual dispatches, dispatching contingency reserves and allowing or blocking dispatches as needed to maintain system reliability. They will also be able to run its shadow settlement using the data coming out of the Parallel Operations system. During the Parallel Operation period, the ISO will calculate and post settlement statements for the EIM entity to download and compare with their shadow settlement results.

Entrance Criteria:

- All Market Simulation structured and unstructured scenarios are completed successfully as part of the readiness certification requirements.

Exit Criteria:

- All readiness criteria have been met and readiness certification is filed with FERC (no less than 30 days prior to go-live).
- One full month of Parallel Operations testing is complete after FERC readiness certification.

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5 Access and Provisioning


To ensure secure access to the ISO environment and applications, the ISO requires all ISO participants, including new EIM entities, to obtain appropriate security access. This applies to individual users of the applications, as well as interfacing systems that will access the applications. Access must be requested for all users and systems prior to EIM entity entering into any new environment: Map Stage, Stage, and Production.

The process for obtaining access is as follows:

- The EIM entity identifies individuals from both EIM Entity and Merchant sides as User Access Administrators (UAA).
- Approximately four weeks prior to the new environment being made available to the EIM entity, the ISO will provide the UAAs with the ability to provision access to that environment within the AIM application.
- UAAs determine which individuals and which systems require access to ISO systems and submit an access request via the AIM application. Computer Based Training (CBT) is available for users of the AIM application.
- Certificates need to be installed for each user to access the ISO systems. See the Application Access page on the ISO public website for additional information.
<http://www.caiso.com/participate/Pages/ApplicationAccess/Default.aspx>


Access may be required for the following ISO systems:

ISO System	Merchant or EIM Entity
BSAP	Both
SIBR	Both
OMS	Write Entity, Read only Merchant
ADS	Both
CMRI	Both
MRI-S	Both
BAAOP	EIM Entity only
ALFS (optional)	EIM Entity only
MasterFile	Both

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6 Things to Consider

- End users are most effective if trained as close to Parallel Operations as possible.
- SMEs are most effective if trained close to the time the training phase begins. SMEs for the following should be identified:
 - Metering,
 - Settlement,
 - Market,
 - Reliability, and
 - Outage.
- Identified SMEs become EIM experts and are embedded into the core project / implementation, participating in Functional Testing, Market Simulation, and Parallel Operations.
- SMEs team up with internal trainers to customize the training for their organization (bid-to-bill) based on ISO training material and knowledge gained during testing. End user and operator hands-on training can begin in the second half of Day in the Life Testing, once the systems become stable.

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7 Testing Dependencies

Test	Owner	Environment	Agreements	SCIDs	RTM	SCADA/EMMS	GRDT / Master File	FNM	MM
Connectivity Testing									
Master File	ISO/EIM Entity	Map Stage	EE Agreement, EIM Entity SC Agreement	Required	N/A	N/A	N/A	N/A	N/A
BSAP	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	Required	N/A	N/A	N/A	N/A	N/A
SIBR	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	Required	N/A	N/A	N/A	N/A	N/A
BAAOP	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	Required	N/A	N/A	N/A	N/A	N/A
Forecasts/ALFS	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	Required	N/A	N/A	N/A	N/A	N/A
OMS	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	Required	N/A	N/A	N/A	N/A	N/A
ADS/EMS	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	Required	N/A	N/A	N/A	N/A	N/A
CMRI	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	Required	N/A	N/A	N/A	N/A	N/A
OASIS	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	Required	N/A	N/A	N/A	N/A	N/A
Metering/Settlements	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	Required	N/A	N/A	N/A	N/A	N/A
Functional Integration Testing									
Master File	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	Required			Final GRDT	Available in test	Available in test
BSAP	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	Required			MF in test		
SIBR	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	Required			MF in test		
BAAOP	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	Required			MF in test	Available in test	Available in test
VER Forecasts/ALFS	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	Required			MF in test, Registration of VER Resources		

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Test	Owner	Environment	Agreements	SCIDs	RTM	SCADA/EMMS	GRDT / Master File	FNM	MM
OMS	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	Required			MF in test	Available in Map Stage	Available in Map Stage
ADS	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	Required	Installed in Map Stage & output	Needed to get RTM output	Needed to get RTM output		Needed to get RTM output
EMS	ISO/EIM Entity	Map Stage		N/A		Required		Required	
CMRI	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	SCID	Installed in Map Stage & output	Needed to get RTM output	Needed to get RTM output		Needed to get RTM output
OASIS	ISO/EIM Entity	Map Stage	EE Agreement / EIM Entity SC Agreement	SCID	Installed in Map Stage & output	Needed to get RTM output	Needed to get RTM output		Needed to get RTM output
Day in the Life Scenarios	ISO/EIM Entity	Map Stage	EIM Entity SC Agreement	SCID	Installed in Map Stage & output	Needed to get RTM output	Needed to get RTM output	Available in Map Stage	Needed to get RTM output
Market Simulation	ISO/EIM Entity	Map Stage	EIM Entity SC Agreement	SCID	Installed in Map Stage & output	Needed to get RTM output	Needed to get RTM output	Available in Map Stage	Needed to get RTM output
Parallel Operations	ISO/EIM Entity	Stage	All Agreements	SCID	Installed in Stage & output	Needed to get RTM output	Needed to get RTM output	Available in Stage	Needed to get RTM output