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CRR Update

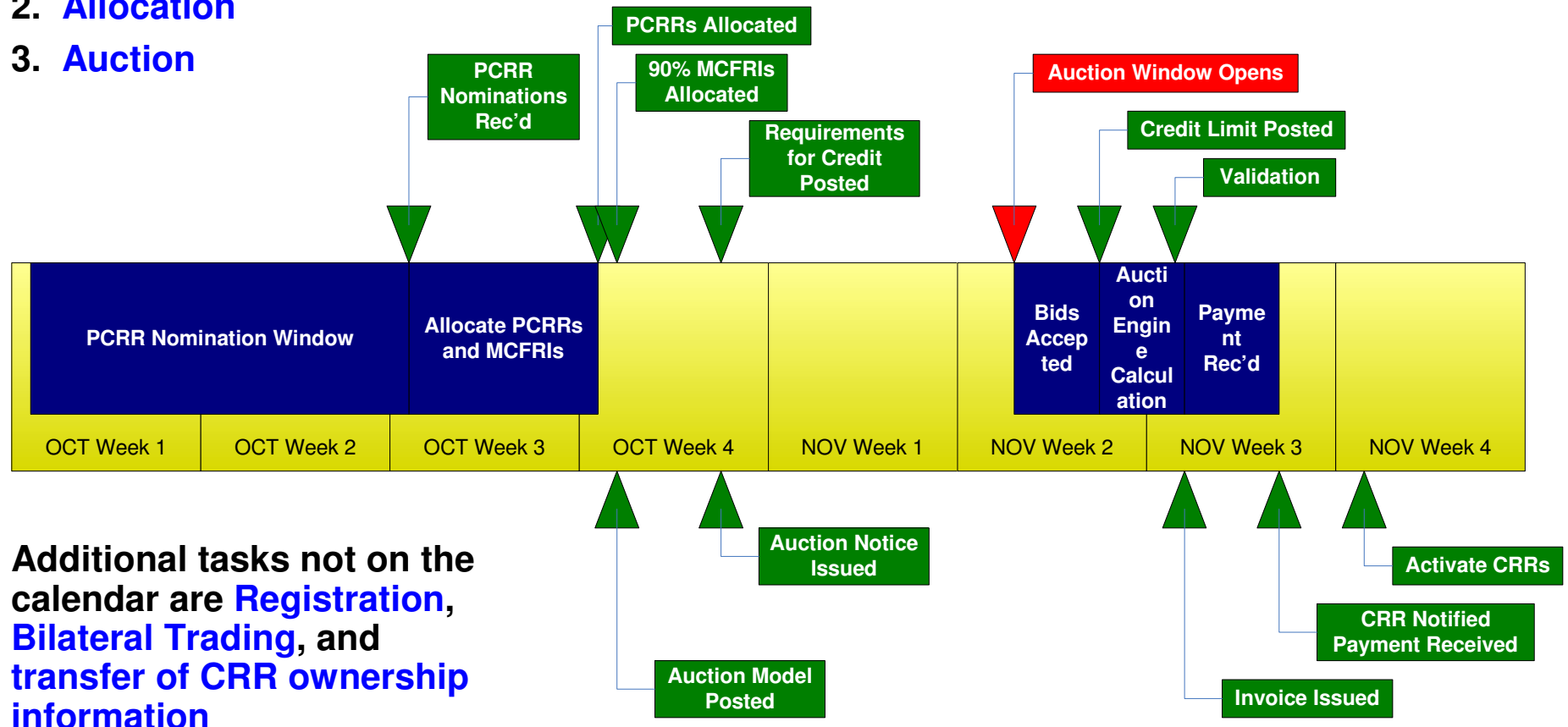Shawna R. Jirasek and Beth Garza

2006.09.29

CRR Action Plan

- **Today – The CRR Story**

- **Tuesday 10/3 to TPTF list-serve**

  – CRR Requirements

  – CRR Team Response to Comments

  – Protocol Coverage Overview

- **TPTF Comments back by Thursday 10/5**

- **TPTF October 9th/10th – request vote to approve CRR Requirements**

CRR Monthly Auction Timeline

The timeline indicates the basic flow of activities for the allocation and auction process in a sample month. The major activities (detailed on the following pages) are:

1. **Building the CRR Network Model**
2. **Allocation**
3. **Auction**

PCRRs Allocated

PCRR Nominations Rec'd

90% MCFRIs Allocated

Requirements for Credit Posted

Auction Window Opens

Credit Limit Posted

Validation

					Bids Accepted	Auction Engine Calculation	Payment Rec'd	
PCRR Nomination Window		Allocate PCRRs and MCFRIs						
OCT Week 1	OCT Week 2	OCT Week 3	OCT Week 4	NOV Week 1	NOV Week 2	NOV Week 3		NOV Week 4

Auction Notice Issued

Auction Model Posted

Activate CRRs

CRR Notified Payment Received

Invoice Issued

Additional tasks not on the calendar are Registration, Bilateral Trading, and transfer of CRR ownership information

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Registration

Registration is not in the CRR System scope, however;

- CRR Account Holders are a new type of market participant that will need to be registered

- NOIEs and QSEs that are CRR Account Holders will have to be identified to manage CRRs in the Day Ahead Market (DAM not in CRR Scope)

Creating the CRR Model

For the monthly auction the CRR Network Model will be based on a model developed approximately 45 days in advance of the first day of the month – this implies a single model very similar to the Operational Model on the 1st day of the month;

For the Annual Auction the CRR Network model will be based on 'planning cases' from the NMMS, estimated from the 1st day of each operating month for a 24 month period.

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CRR Network Model Information

These activities will be done within the NMMS by CRR Market Operators (taken from NMMS use cases)

Creating CRR Model

CRR Market Operator will create the Congestion Revenue Rights Model using the NMMS software and the selected

- *Network Operations Model Change Requests (NOMCRs)*
- *Planning Model Change Requests (PMCRs)*
- *Outages as required and appropriate*
- *Special Action Model Requests (SAMRs) will also be selected and included in the model package (including SPSs and RAPs)*

The output is a PSS/E RAWD file. The CRR Contingency File and the CRR Settlement File should also be packaged and sent with this model if required.

Known assumptions, limitations, constraints, or variations that may affect this use case:

- *The CRR Model will be generated each month 45 days prior to the proposed auction month*
- *The NOMCRs, SAMRs, Outages, PMCRs and Dynamic Ratings that will be applied include those up to and including the first day of the proposed auction month.*
- *The CRR User will create this model using the Case Builder.*
- *Topology Processing must be executed prior to inserting the PMCRs into the Model.*

Creating CRR Settlement File

Create the Settlement File for the CRR Model using the NMMS software and the CRR Model for a specified date. The output is a CSV file.

Creating CRR Contingency File

Based on the dates used for the Congestion Revenue Rights Model, produce the Contingency File that corresponds to the date using the NMMS software. The output is a CSV file.

Known assumptions, limitations, constraints, or variations that may affect this use case:

- *The Contingency File for the CRR Model will be generated each month on the first day of the Month and will correspond to the CRR Model that is created on that same date.*
- *The CRR User will create this file using the Case Builder.*
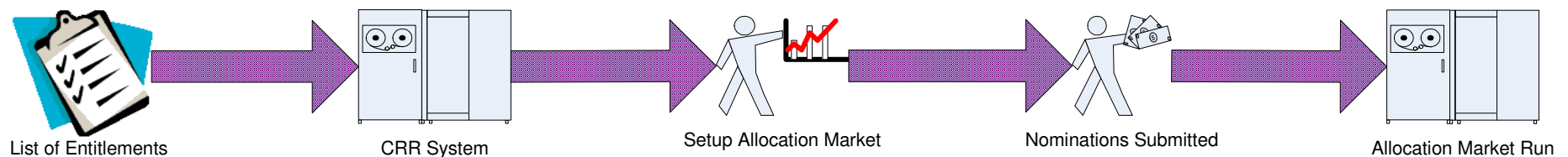
Network Model Format (PSS/E vs. CIM)

- **The proposed approach**
  - CRR uses PSS/E – native, out of the box format
  - CIM > PSS/E is out of the box feature of NMMS tool
  - NMMS publishes CIM and PSS/E – NMMS is CIM compliant
  - Minimize cost and risk

- **Leverages the best of both worlds**
  - CIM compliant at the network model source (NMMS)
  - Consistent with Nodal Program approach to support applications' native interfaces and have data provider being responsible for data transformations.

CRR Products / Time of Use

- Weekday On Peak Time of Use Blocks (hours 0700 – 2200 M-F)

- Weekend On Peak Time of Use Blocks (hours 0700 – 2200 SS)

- Off Peak Time of Use Blocks (hours 0000 – 0600; 2300 – 2400 all days)

- 24-hour combination of the above

  - if you win a 24-hour block, you will be awarded the three primary times of use

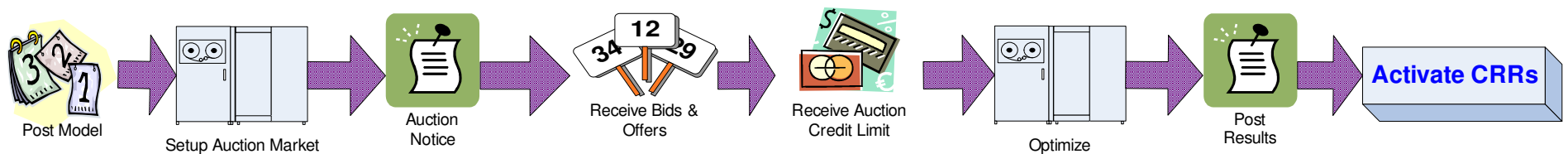- Awarded in whole month strips, not less than one month

Allocation Process

1. Develop Entitlements list and upload to the CRR system – Static

2. Set up Allocation market - nomination submission window, % of network capacity to use, select network models, contingency lists, constraints (interface limits) – 45 days in advance of 1st of month for monthly, during PCRR nomination window for annual

3. PCRR nominations submitted over a two week period – Completed 15 business days prior to monthly auction (25 days prior to annual auction)
   - NOIEs only, select the type of PCRR they want

4. Allocation market run – any infeasibility handled through deration and re-evaluated monthly – PCRRs and MCFRIs completed 10 business days in advance of monthly auction
   - Yet to determine how to limit allocation of non-baseload PCRRs to 40% capacity factor

List of Entitlements   CRR System   Setup Allocation Market   Nominations Submitted   Allocation Market Run

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Auction Process

1. Post model for use in Auction – 10 business days in advance of monthly, 20 business days in advance of annual

2. Set up Auction market - bid/offer submission window, % of network capacity to use, select network models, contingency lists, constraints (interface limits) – 10 business days in advance of monthly, 20 business days in advance of annual

3. Auction notice – 10 days in advance of monthly, 20 days in advance of annual

4. Receive bids and offers – 3 days for monthly auction (2nd Tuesday), 2 days for annual (1st Tuesday of Nov)

5. Receive Auction credit limit from CMM – Immediately before kicking off optimization

6. Optimize – going in concept for optimization 40-hour monthly/80-hour annual

7. Validate results – 1 business day

8. Post results - notify winners; notify Settlements and Credit
    –   24-Hour block receive Weekday, Weekend and Off-Peak
    –   Still figuring out how to handle no-payment of auction invoices

9. Activate CRRs in system for trading – 3 business days after invoices issues

Post Model   Setup Auction Market   Auction Notice   Receive Bids & Offers   Receive Auction Credit Limit   Optimize   Post Results   **Activate CRRs**

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Auction

Annual Auction

- 55% of network capacity for months 1-12

- 15% of network capacity for months 13-24

- Offers of MCFRIs and previously awarded CRRs; whole months not less than one month

- Obligations will be for one-month strips for one-month terms, between any source and sink

Monthly Auction

- 90% of network capacity for coming month

- Offers of PCRRs, MCFRIs and previously awarded CRRs; in whole month strips

- Obligations will be available between any sources and sinks

Buying in an Auction
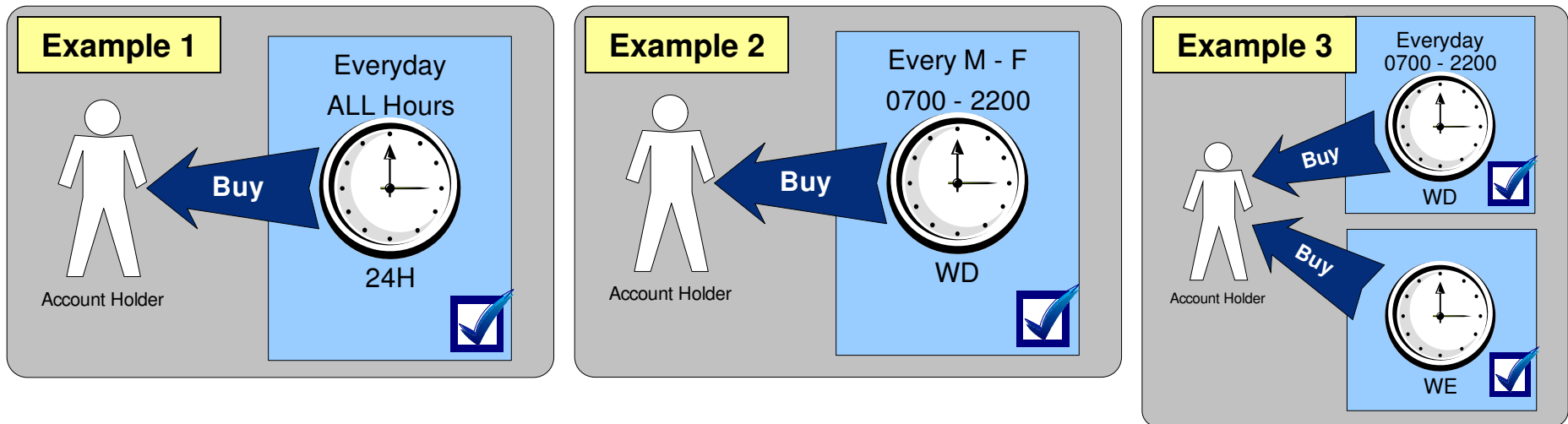
- **Example 1 shows an Account Holder's ability to buy a 24-Hour block that includes ALL Hours Everyday**
- **Example 2 shows an Account Holder's ability to buy a Weekday block that includes Hours 0700 – 2200 Every Monday through Friday**
- **Example 3 shows an Account Holder's ability to buy multiple time period in separate blocks, in this example:**
  – A Weekday block that includes Hours 0700 – 2200 Everyday, and
  – A Weekend block that includes Hours 0700 – 2200 Saturday through Sunday
  – Not shown – an Off-Peak block.
  – Bids for multiple blocks are not linked.

Products in the Auction
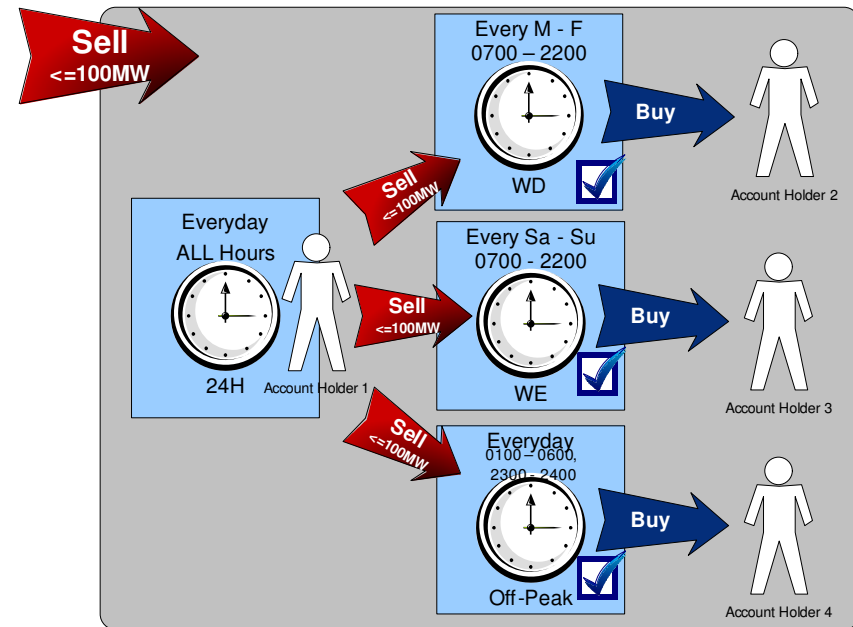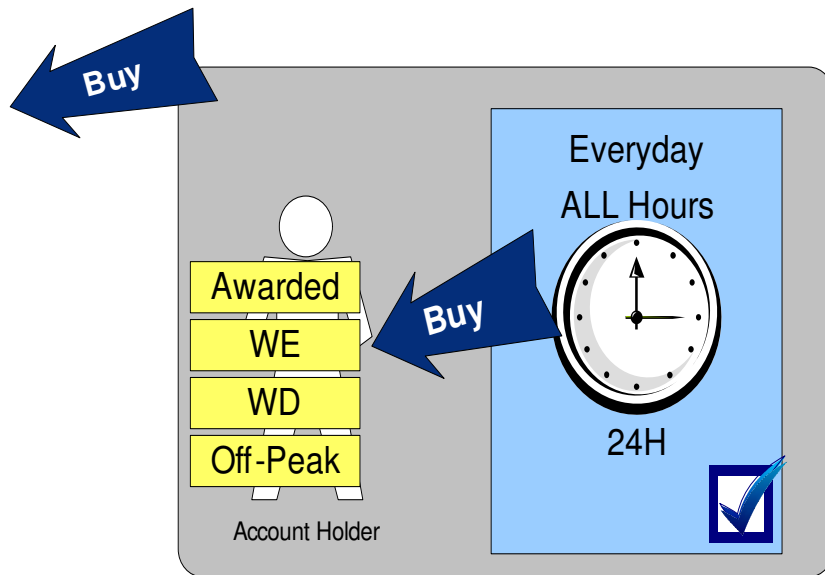
- **24-Hour Buy awarded to the Account Holder as three separate blocks: Weekend, Weekday, and Off-Peak**

- **In Account Holder can offer his holdings in three types of blocks: Weekday, Weekend, and Off-Peak.**
  - Weekday, Weekend, and Off-Peak blocks offered are not linked. Therefore, there is no guarantee that all will be sold.
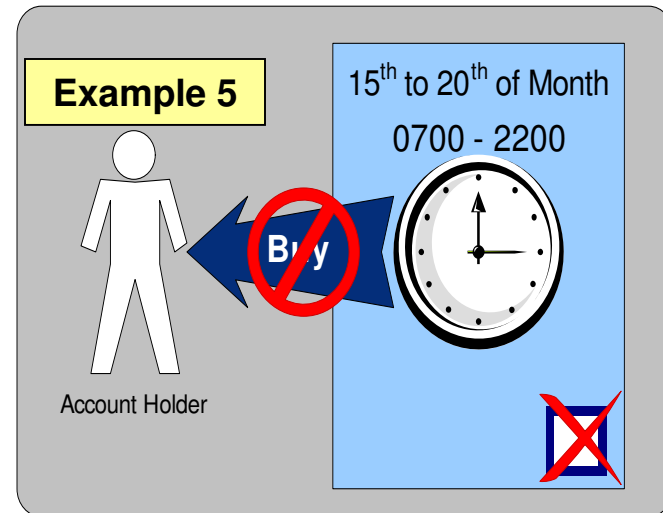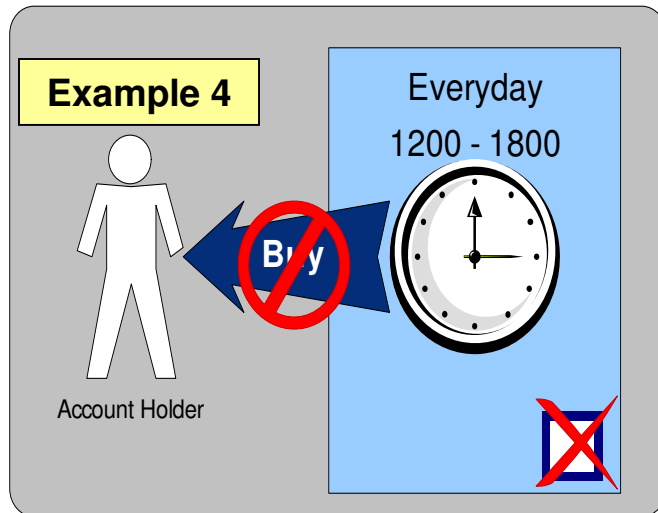
- **Example 4 shows that an Account Holder may NOT buy a block that includes hours other than 0700 – 2200.**

- **Example 5 shows that an Account Holder may NOT buy a block that does not include all of the days of the month.**

Bilateral Trading

CRRs can be traded:

- Between any two registered Account Holders
  - Initiated by the seller
  - Approved by the buyer
- In time of use amounts for a particular day(s)

Once a single day of a CRR month is bilaterally traded, the remaining days of the month may not be offered into an annual or monthly auction

Approval of bilateral trades will be subject credit approval based on the impact of the trade to both the current owner and proposed owner

All bilateral trades must be registered in the CRR system at a time TBD to be available in the Day Ahead Market

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Supported Bilateral Trade Alternatives
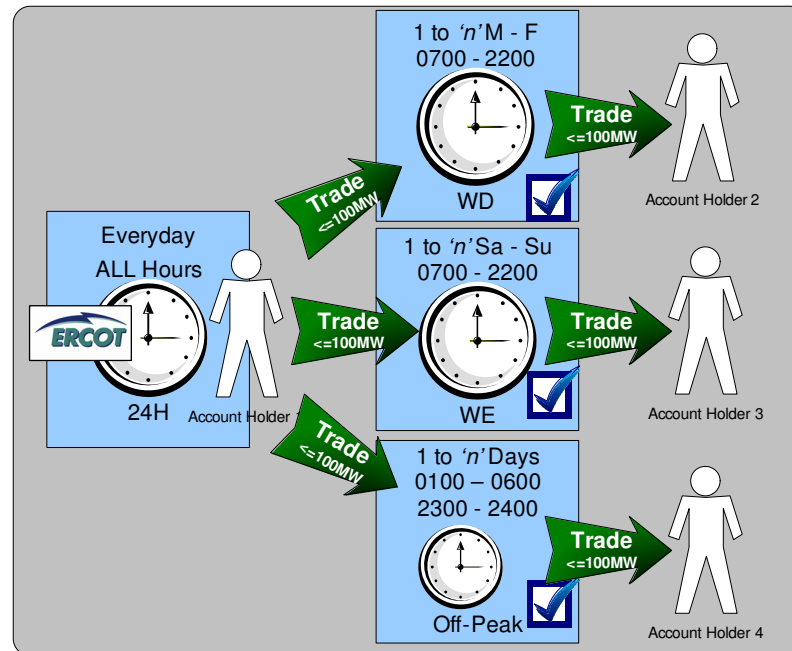
- **Account Holder that owns a 24-Hour block can trade his holdings in three types of blocks: Weekday, Weekend, and Off-Peak.**
  - Any of the blocks can be for any number of days.
  - Weekday and Weekend blocks can only be traded for hours 0700 – 2200.
  - Off-Peak blocks can be traded for hours 0100 – 0600 and 2300 – 2400.

CRR Ownership Information Transfer

Monthly/Annual Settlements

- After validation of the auction results, the CRR system will send the record of all activity to the Settlements system for invoice
- Upon confirmation from the Settlements system that the invoices are paid in full, the CRR System will activate ownership
    - Still figuring out how to handle non-payment of auction invoices
- Settlements will be responsible for disbursing auction revenue

Daily Ownership Record

- Each day prior to 0600 (exact time TBD) the CRR System will pass a record of all owned CRRs to the day-ahead market and to the Settlements System

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CRR System Customizations

Below is a list of customizations to the Nexant i-Hedge solution and their relative level of impact to cost, scope and schedule (based on August 1, 2006 protocols).

i-Hedge = 50% off-the-shelf, 25% configuration ,25% customization (below)

High Impact
- ✓ **Annual (24 month) multi-period markets**
- - **Hourly granularity of bilateral trading – NPRR028**

Medium Impact
- ✓ **Multi-period by times of use markets**
- ✓ **Monthly PCRR 'True-Up'**
- ✓ **PCRR Graduated Release**
- ✓ **Credit limit applied in optimization**

    Nominations of PCRRs business logic and user interface
    - ✓ Allocation of flowgates, entitlement process
    - ? Validation of capacity options
- - **24-hour combinatorial of time of use blocks – NPRR027**

Low Impact
- ✓ **Condition the release of CRRs to Account Holder to payment**
- ✓ **3 time of use blocks**
- ✓ **Settlement point participation factor calculation**
- ✓ **Redundant manual input data alternative**
- - **MW granularity – NPRR012**
- ? **Credit check process in bilateral trading – this is a continuing discussion with Credit Monitoring, the process and abilities for credit are TBD**

> ✓Included in budget
> -NPRR made COTS
> ?Process/Impact TBD

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Additional CRR Network Model Information

Network Model Format (PSS/E vs. CIM)

- **Why PSS/E?**
  - Format is de-facto industry standard
  - Bus/branch model
  - CRR Requires a bus/branch model
  - CRR COTS imports PSS/E natively (out-of-box)
  - Network Model size using PSS/E format is significantly smaller than the same model in CIM XML
- **CIM Characteristics**
  - Well accepted Industry standard
  - CIM model extensions may be required to cover CRR needs
  - From the network model perspective, CIM describes bus/breaker model that is much more detailed
  - NMMS is CIM compliant – can export in both CIM and PSS/E
  - CIM -> PSS/E possible (out-of-box feature of the NMMS tool); PSS/E -> CIM not possible
  - For CRR CIM bus/breaker must be translated to bus/branch by either:
    - Sender/Provider (NMMS – Low Cost, Low Risk, No Schedule Impact)
    - Receiver/Consumer (CRR - High Cost, High Risk, High Schedule Impact)
    - Integration Layer (High Cost, High Risk, High Schedule Impact)

- **The proposed approach**
  - NMMS publishes CIM and PSS/E
  - CRR uses PSS/E
  - Minimize cost and risk

- **Leverages the best of both Worlds**
  - CIM compliant at the network model source (NMMS)
  - Leverages PSS/E as de-facto standard native to the CRR off-the-shelve product
  - Consistent with Nodal Program approach to support applications' native interfaces and have integration layer or data provider being responsible for data transformations.

CIM to PSS/E Transformation

Bus/Breaker Model

Bus/Branch Model

Bus A

Bus B 1

Line 1

Line 2

Bus B 2

CIM to PSS/E

Bus A

Line 1

Line 2

Bus B