



MULTI-DAY MINIMUM RUN TIME PROJECT: MEMBER TESTING

*Working together to responsibly and economically
keep the lights on today and in the future.*



AGENDA

- Multi-Day Minimum Run Time Training Overview
- Member Test Expectations
- SPP Test Expectations
- Test Schedule
- Settlements Testing Information
- Helpful Links
- Questions



Stakeholder Training

MULTI-DAY MINIMUM RUN TIME OVERVIEW

RR382, RR540, AND RR569

*Working together to responsibly and economically
keep the lights on today and in the future.*



SPPStakeholderTraining@spp.org

OBJECTIVES



IDENTIFY the gaming issue with Make-Whole Payments (MWP) and Multi-Day Minimum Run Times



SUMMARIZE the new MWP requirements around Multi-Day Minimum Run Times

HOUSTON, WE HAVE A PROBLEM

MAKE-WHOLE PAYMENTS AND
MULTI-DAY MINIMUM RUN TIMES

TODAY'S PROCESS

Day-Ahead
(DA) Market
or Reliability
Unit
Commitment
(RUC) study
kicks off



Run Security
Constrained
Unit
Commitment
(SCUC)
algorithm



Looks at
applicable
Operating
Hours and
economically
commits
resources



Resources
eligible for
MWP for
those hours



Also MWP
eligible for
any must-
run hours
based on
Min. Run
Time

CAN GAME THE SYSTEM

DAY 1 – DA Market Commitment (30 Hour Min. Run Time)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

DAY 2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
X	X	X	X	X	X																		

Security Constrained Unit Commitment (SCUC) analyzed all hours of the Operating Day – MWP Eligible

SCUC did not... the
rem...
Run...
r...

- Could also increase Min. Run Time AFTER Commitment and increase offers, accordingly
- Would...
- Could receive MWP based on higher offer

WHAT DO WE NEED TO DO?

RR382

Minimize costs eligible for MWP by limiting the offer used to determine those costs (DA Resource Offers (Energy, Start-Up & No-Load) vs. RT Resource Offers (Energy, Start-Up, & No-Load))

RR540

Ensure governing language consistent with design and intent of all RRs previously approved prior to implementation of RR382

RR569

Correct additional Settlement Protocol language prior to implementation

HOUSTON, WHAT ARE WE GOING TO DO?

PROCESS AND SYSTEM REVISIONS

1. BEGINNING OF MINIMUM RUN TIME

- First interval of commitment
- Online from offline state

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Even if not original commitment
(e.g. RUC early start)

2. HOURS CONSIDERED BY SCUC

If continuous set of committed hours were considered by SCUC, made whole to offer

- Day 1 of continuous commitment that spans multiple days
- 1st Commitment if continuous set of committed hours in same Operating Day

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
									X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

SCUC Evaluated = MWP Eligible

3. HOURS NOT CONSIDERED BY SCUC

After hours that were part of SCUC study,
for remainder of Min. Run Time:

TWO RULES:

1. Did MP knowingly lower offer to get committed?

Offers evaluated by SCUC < Mitigated Offers for same hours = Not MWP Eligible

2. If MWP Eligible, what costs are used for MWP?

If eligible, made whole to lesser of DA Offer (Energy, Start-up & No Load)/RT Offer (Energy, Start-Up & No Load) or Mitigated Offer

4. CONTINUOUS COMMITMENTS

Eligibility for MWP based on Min. Run Time crossing markets for continuous set of commitments

DAY 1 – DA Market Commitment (24 Hour Min. Run Time)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

DAY 2 – RUC Extension

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
X	X	X	X	X	X																		

5. AFTER MINIMUM RUN TIME

Made whole to offers related to current commitment, same as today:

- Energy and No Load:
Made whole to current committed offers
- RUC Commits:
Made whole to committed Real-Time (RT) Offers (Energy to Min);
Made whole to “as dispatched” RT Offers (Energy above Min)
- Change to Min. Run Time:
Seen as must run; Reevaluated using offers from initial commitment

WHAT QUESTIONS DO YOU HAVE?

HIGH-LEVEL EXAMPLE

MINIMUM RUN TIME = 72 HOURS (DAY 1)

DAY 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Commitment Status: Market

DA Energy Offer: \$30

Mitigated Offer: \$40

DA Market commits resource (online from offline state at 0000)

MWP Eligible since SCUC evaluated hours

MINIMUM RUN TIME = 72 HOUR (DAYS 2 AND 3)

DAY 1

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
SCUC Evaluated																							

DAY 2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

RT Offer: **\$50**
 Mitigated Offer: \$40
 Considered must-run
 due to Min. Run Time

DAY 3

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

MINIMUM RUN TIME = 72 HOUR (DAYS 2 AND 3)

DAY 1

1	2	3	4	5	Day 1 DA Offer = \$30						19	20	21	22	23	24
X	X	X	X	X	Day 1 Mitigated Offer = \$40						X	X	X	X	X	X
					DA Offer < Mitigated = NO MWP											

DAY 2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

1. Did MP knowingly lower offer to get committed?

DAY 3

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

MINIMUM RUN TIME = 72 HOUR (DAYS 2 AND 3)

DAY 1

1	2	3	4	5
X	X	X	X	X

Day 1 DA Offer = **\$42**

Day 1 Mitigated Offer = \$40

DA Offer > Mitigated = MWP Eligible

20	21	22	23	24
X	X	X	X	X

DAY 2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

1. Did MP knowingly lower offer to get committed?

DAY 3

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

MINIMUM RUN TIME = 72 HOUR (DAYS 2 AND 3)

DAY 1

1	2	3	4	5
X	X	X	X	X

Days 2 & 3 RT Offer = \$50
 Days 2 & 3 Mitigated Offer = \$40
Made whole to lesser = \$40

21	22	23	24
X	X	X	X

DAY 2

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

2. If MWP eligible, what costs are used for MWP?

DAY 3

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

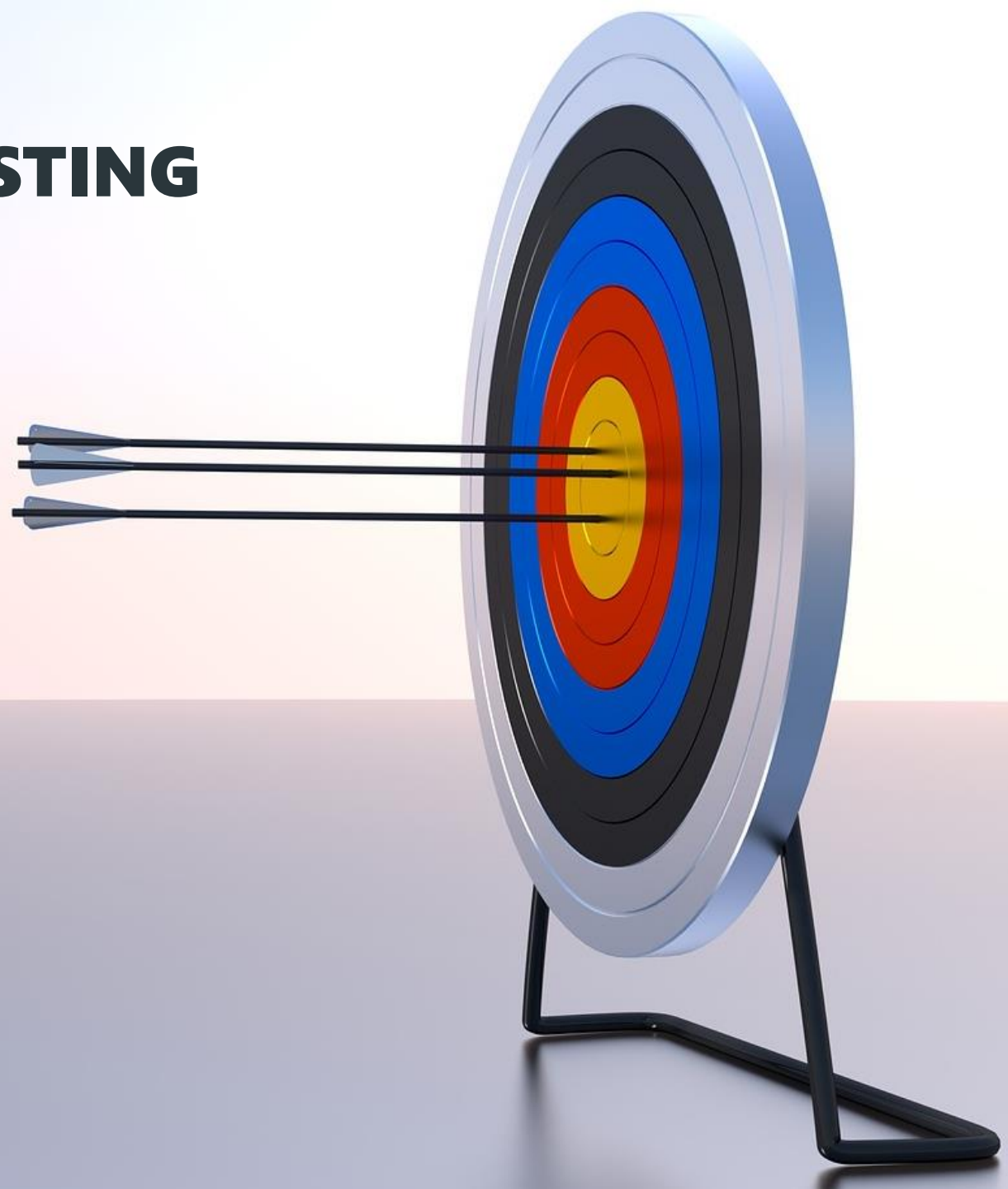
WHAT QUESTIONS DO YOU HAVE?

MEMBER TEST EXPECTATIONS

MULTI-DAY MINIMUM RUN TIME
RR382, RR540 AND RR569

OBJECTIVE OF MEMBER TESTING

Allow the opportunity to verify that SPP and member systems and processes are prepared and ready to support the Settlement changes for Multi-Day Minimum Run Time (RR382, RR540 and RR569).



WHO SHOULD TEST

- ✓ Resource owning entities
- ✓ Member and vendor-developed systems that utilize Shadow Settlement Systems may be impacted by this project



SPP TEST EXPECTATIONS

MULTI-DAY MINIMUM RUN TIME
RR382, RR540 AND RR569

WHAT ARE THE SPP TESTING EXPECTATIONS?

SUPPORT

- Member testing in the Member Testing Environment (MTE)

RESPOND

- To Request Management System (RMS) tickets in a timely manner

COMMUNICATE

- To Change User Forum (CUF) & Settlements User Forum (SUF) any testing changes/updates

POST

- Known Issue Log weekly to Settlements project folder after testing starts

WHAT ARE THE MP TESTING EXPECTATIONS?

Resource-owning MPs:

- Responsible for ensuring settlement scenarios created based on offer data parameters submitted in MTE environment during member testing period.

MPs should:

- Submit/update data (bids/offer for markets, meter/bilateral schedules for settlements) in order to test specific scenarios.

Otherwise:

- Markets uses last submitted data for offers and bids.
- Settlements uses state estimator for meter.

WHAT ARE THE MP TESTING EXPECTATIONS?

- First Operating Day (07/12/2023) will post on Tuesday, 07/19/2023.
- Last Operating Day (09/05/2023) will post on Tuesday, 09/12/2023.

An accelerated calendar will be used in MTE, the S53 posts 35 days after the operating date.

There will be no S120s posted for this project. The first four weeks of member testing will contain only S7s and the last four weeks will contain S7s and S53s.

TEST SCHEDULE

MULTI-DAY MINIMUM RUN TIME
RR382, RR540 AND RR569

MEMBER BID TO BILL TESTING DATES

Includes Operating Dates:
July 12 through September 5

Eight (8) weeks of bid-to-bill testing



SETTLEMENTS TESTING INFORMATION

MULTI-DAY MINIMUM RUN TIME
RR382, RR540 AND RR569

DATA INPUTS TO HELP PRODUCE RESULTS FOR SCENARIOS

- Review MIPO for Day-Ahead and RUC Scenarios
- Scenarios can be setup for any day of week and multiple resources can be used
 - Review Market Offer Data in MTE
 - Day-Ahead, Real-Time Energy AND Mitigated Energy Offers
 - Offer Parameters should be reviewed/updated to help with commitments:
 - Startup cost and time (Cold, Intermediate, Hot)
 - No Load cost
 - Max Daily/Weekly Starts
 - Min Run Time
 - Min Down Time
 - Min to Off Time
 - Sync to Min Time

DAY-AHEAD (DA) SETTLEMENT SCENARIO ONE

DA Scenario 1: *Commitment greater than 24 hours with no change in Min Run Time; Eligible for Mitigated MWP*

- Scenario should include submission of Energy Offers with Min. Run Time greater than 24 hrs.
- DA Resource Offers (Energy, Startup, and No Load) should be greater than or equal to DA Mitigated Resource Offers (Energy, Startup, and No Load).
 - Min. Down Time should be 30 min. or less
 - Startup (Cold, Intermediate, Hot) should be 5 min. or less
 - Verify Max. Weekly Starts is updated to 10 or higher
 - Synch-to-min 5 min. or less

Expected Results:

Operating Day (OD) 1 along with days after Min. Run Time is met will be eligible for a non-mitigated MWP (normal). OD 2 through Min. Run Time will be eligible for a Mitigated MWP.

DAY-AHEAD (DA) SETTLEMENT SCENARIO TWO

DA Scenario 2: *Commitment greater than 24 hours with no change in Min. Run Time; NOT eligible for Mitigated MWP*

- Scenario should include submission of Energy Offers with a Min. Run Time greater than 24 hrs.
- DA Resource Offers (Energy, Startup, and No Load) should be less than DA Mitigated Resource Offers (Energy, Startup, and No Load).
 - Min. Down Time should be 30 min. or less
 - Startup (Cold, Intermediate, Hot) should be 5 min. or less
 - Verify May. Weekly Starts is updated to 10 or higher
 - Synch-to-min 5 min. or less

Expected Results:

Operating Day (OD) 1 along with days after Min. Run Time is met will be eligible for a non-mitigated MWP (normal). OD 2 through Min. Run Time will not be eligible for a DA MWP.

DAY-AHEAD (DA) SETTLEMENT SCENARIO THREE

DA Scenario 3: *Commitment greater than 24 hours with a change in Min. Run Time; Eligible for Mitigated MWP*

- Scenario should include submission of Energy Offers with a Min. Run Time for two days.
- After Resource has been committed in DA Market, Min. Run Time should be updated to be greater than current online time (extend Min. Run Time for a few more days).
- DA Resource Offers (Energy, Startup, and No Load) should be greater than DA Mitigated Resource Offers (Energy, Startup, and No Load).
 - Min. Down Time should be 30 min. or less
 - Startup (Cold, Intermediate, Hot) should be 5 min. or less
 - Verify Max. Weekly Starts is updated to 10 or higher
 - Synch-to-min 5 min. or less
 - Example:
 - On Operating Day (OD) 1 Min. Run Time is submitted for 48 hours
 - Unit is committed for 48 hours
 - On OD 2 (next DA Market) Min. Run Time is submitted for 72 hours

Expected Results: OD 1 along with days after Min. Run Time is met will be eligible for non-mitigated MWP (normal). OD 2 through Min. Run Time will be eligible for Mitigated MWP.

DAY-AHEAD (DA) SETTLEMENT SCENARIO FOUR

DA Scenario 4: *Commitment greater than 24 hours with a change in Min. Run Time; NOT eligible for Mitigated MWP*

- Scenario should include submission of Energy Offers with a Min. Run Time for two days.
- After Resource has been committed in DA Market, Min. Run Time should be updated to be greater than current online time (extend Min. Run Time for a few more days).
- DA Resource Offers (Energy, Startup, and No Load) should be less than DA Mitigated Resource Offers (Energy, Startup, and No Load).
 - Min. Down Time should be 30 min. or less
 - Startup (Cold, Intermediate, Hot) should be 5 min. or less
 - Verify Max. Weekly Starts is updated to 10 or higher
 - Synch-to-min 5 min. or less
 - Example:
 - On Operating Day (OD) 1 Min. Run Time is submitted for 48 hours
 - Unit is committed for 48 hours
 - On OD 2 (next DA Market) Min. Run Time is submitted for 72 hours

Expected Results: OD 1 along with days after the Min. Run Time is met will be eligible for a non-mitigated MWP (normal). OD 2 through Min. Run Time will not be eligible for DA MWP.

RUC SETTLEMENT SCENARIO ONE

RUC Scenario 1: *Commitment with a Min. Run Time between two and four hours with no change in Min. Run Time; Eligible for Mitigated MWP*

- Scenario should include submission of Energy Offers with a Min. Run Time greater than 2 and less than 4 hours.
- Real-Time (RT) Resource Offers (Energy, Startup, and No Load) should be greater than or equal to RT Mitigated Resource Offers (Energy, Startup, and No Load).
 - **Update Day-Ahead Status to Not Participating**
 - Min. Down Time should be 30 min. or less
 - Startup (Cold, Intermediate, Hot) should be 5 min. or less
 - Verify Max. Weekly Starts is updated to 10 or higher
 - Synch-to-min 5 min. or less

Expected Results:

First RUC commitment along with the days after Min. Run Time eligible for normal MWP,
Second RUC commitment up to Min. Run Time will be eligible for Mitigated MWP.

RUC SETTLEMENT SCENARIO TWO

RUC Scenario 2: *Commitment with a Min. Run Time between two and four hours with no change in Min. Run Time; Eligible for Mitigated MWP*

- Scenario should include submission of Energy Offers with Min. Run Time greater than 2 and less than 4 hours.
- Real-Time (RT) Resource Offers (Energy, Startup, and No Load) should be less than RT Mitigated Resource Offers (Energy, Startup, No Load).
 - **Update Day-Ahead Status to Not Participating**
 - Min. Down Time should be 30 min. or less
 - Startup (Cold, Intermediate, Hot) should be 5 min. or less
 - Verify Max. Weekly Starts is updated to 10 or higher
 - Synch-to-min 5 min. or less

Expected Results:

First RUC commitment along with the days after Min. Run Time eligible for normal MWP, Second RUC commitment up to Min. Run Time will not be eligible for a Mitigated MWP.

RUC SETTLEMENT SCENARIO THREE

RUC Scenario 3: *Commitment with a Min. Run Time between two and four hours and update Min. Run Time after a RUC commitment occurs and before the Min. Run Time is met; eligible for mitigated MWP*

- Scenario should include submission of Energy Offers with Min. Run Time greater than 2 and less than 4 hrs.
- After Resource has been committed in RUC study, Min. Run Time should be updated to be greater than current commit time (extend Min. Run Time for a few more hours).
- Real-Time (RT) Resource Offers (Energy, Startup, and No Load) should be greater than or equal to RT Mitigated Resource Offers (Energy, Startup, and No Load).
 - **Update Day-Ahead Status to Not Participating**
 - Min. Down Time should be 30 min. or less
 - Startup (Cold, Intermediate, Hot) should be 5 min. or less
 - Verify Max. Weekly Starts is updated to 10 or higher
 - Synch-to-min 5 min. or less
- Example:
 - On Operating Day (OD) 1 Min. Run Time is submitted between 2-4 hours
 - Unit is committed
 - Update Min. Run Time greater than current commit time

Expected Results:

First RUC commitment along with days after Min. Run Time eligible for normal MWP, Second RUC commitment up to Min. Run Time will be eligible for Mitigated MWP.

RUC SETTLEMENT SCENARIO FOUR

RUC Scenario 4: *Commitment with a Min. Run Time between two and four hours and update Min. Run Time after a RUC commitment occurs and before the Min. Run Time is met; NOT eligible for mitigated MWP)*

- Offers with Min. Run Time greater than 2 and less than 4 hours.
- After Resource has been committed in RUC study, Min. Run Time should be updated to be greater than current commit time (extend the Min. Run Time for a few more hours).
- Real-Time RT) Resource Offers (Energy, Startup, and No Load) should be less than RT Mitigated Resource Offers (Energy, Startup, and No Load).
 - **Update Day-Ahead Status to Not Participating**
 - Min. Down Time should be 30 min. or less
 - Startup (Cold, Intermediate, Hot) should be 5 min. or less
 - Verify Max. Weekly Starts is updated to 10 or higher
 - Synch-to-min 5 min. or less
- Example:
 - On Operating Day (OD) 1 Min. Run Time is submitted between 2-4 hours
 - Unit is committed
 - Update Min. Run Time greater than current commit time

Expected Results:

First RUC commitment along with days after Min. Run Time eligible for normal MWP, Second RUC commitment up to Min. Run Time will NOT be eligible for Mitigated MWP.

HELPFUL LINKS

MULTI-DAY MINIMUM RUN TIME
RR382, RR540 AND RR569

HELPFUL LINKS

[Multi-Day Min Run Time](#)

- <https://spp.org/spp-documents-filings/?id=372266>
- Member Impacting Program Overview
- Known Issues Log – Posted each Friday

QUESTIONS?

MULTI-DAY MINIMUM RUN TIME
RR382, RR540 AND RR569

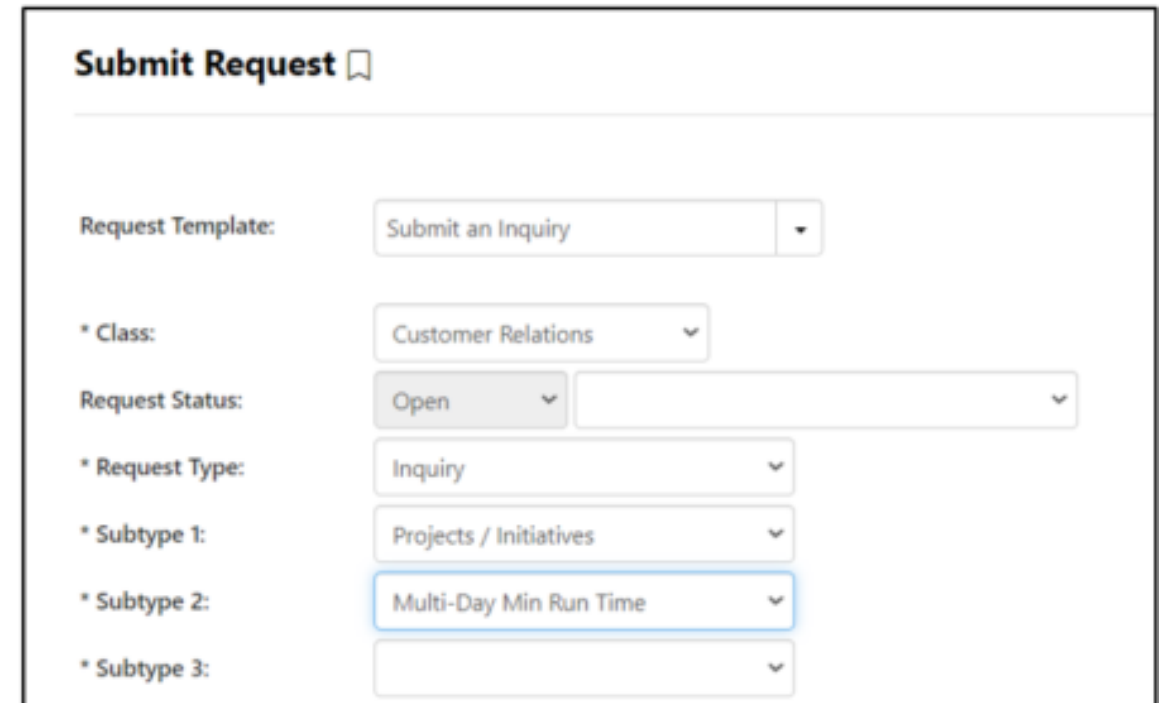
REQUEST MANAGEMENT SYSTEM (RMS)

At any time, members can submit questions about project by completing RMS ticket:
<https://spprms.issuetrak.com/login.asp>.

Select 'Submit an Inquiry';

→ Subtype 1 of '**Projects / Initiatives**'

→ Subtype 2 of '**Multi-Day Min-Run Time**'



The screenshot shows the 'Submit Request' form with the following fields and values:

- Request Template: Submit an Inquiry
- * Class: Customer Relations
- Request Status: Open
- * Request Type: Inquiry
- * Subtype 1: Projects / Initiatives
- * Subtype 2: Multi-Day Min Run Time
- * Subtype 3: (empty)



**WHAT
QUESTIONS
DO YOU
HAVE?**