



Town of Reading Meeting Posting with Agenda

Board - Committee - Commission - Council:

RMLD Citizens Advisory Board

Date: 2019-09-19

Time: 6:30 PM

Building: Reading Municipal Light Building

Location:
General Managers Conference Room

Address: 230 Ash Street

Agenda:

Purpose: General Business

Meeting Called By: Dennis Kelley, Chair

Notices and agendas are to be posted 48 hours in advance of the meetings excluding Saturdays, Sundays and Legal Holidays. Please keep in mind the Town Clerk's hours of operation and make necessary arrangements to be sure your posting is made in an adequate amount of time. A listing of topics that the chair reasonably anticipates will be discussed at the meeting must be on the agenda.

All Meeting Postings must be submitted in typed format; handwritten notices will not be accepted.

Topics of Discussion:

1. Approval of Minutes – D. Kelley, Chair

Suggested Motion: Move that the Citizens' Advisory Board approve the Minutes of the January 23, 2014, Regular and Executive Session, April 9, 2014, April 15, 2015, and April 22, 2015, meetings as written.

2. General Manager's Update – C. O'Brien, General Manager
 - New Wilmington Substation
 - CY20 Budget
 - CAB Membership
3. Report on NEPPA Conference – J. Small, Vice Chair
4. Reliability Update – H. Jaffari, Director of Engineering & Operations
5. Board of Commissioners Meeting Update – D. Hennessy, RMLD Board of Commissioners
6. Scheduling: CAB Meetings and Coverage for Commissioners Meeting – D. Kelley, Chair
7. Adjournment – D. Kelley, Chair

This Agenda has been prepared in advance and represents a listing of topics that the chair reasonably anticipates will be discussed at the meeting. However the agenda does not necessarily include all matters which may be taken up at this meeting.

Attachement 1: Agenda Item 1 - Approval of Minutes

**READING MUNICIPAL LIGHT DEPARTMENT
CITIZENS' ADVISORY BOARD (CAB) MEETING**

**MINUTES
Regular Session**

Time: 6:30 p.m.

Date: Thursday, January 23, 2014

Place: RMLD, 230 Ash Street, Reading, MA, Winfred Spurr/Audio Visual Room

CAB Members Present:

Mr. John Norton, Chairman (North Reading); Mr. Tony Capobianco (Reading); Mr. George Hooper, Vice Chairman (Wilmington); Mr. David Nelson (Lynnfield); Mr. Thomas Ollila, Secretary (Wilmington)

CAB Members Absent:

None

RMLD Commissioner(s) Present:

Mr. Robert Soli

RMLD Staff Present:

Ms. Coleen O'Brien, Mr. Robert Fournier, Ms. Jane Parenteau, Ms. Kathleen Rybak, Mr. William Seldon

Public and Invited Guests Present:

Mr. David Mancuso, Mr. Philip Pacino, Attorney Christopher Pollart from Rubin and Rudman

1. Call Meeting to Order – J. Norton, Chairman

Chairman Norton called the meeting of the Citizens' Advisory Board to order at 6:30 p.m. and noted that the meeting was being audio recorded.

Chair Norton reviewed the format for the meeting with regard to Item 3 – Consideration of Rate Adjustment. Chair Norton recognized and welcomed Commissioner Soli (representing the Board of Commissioners), Commissioners Pacino and Mancuso (attending as members of the public), as well as Mr. Chris Pollart from Rubin and Rudman.

2. Approval of Minutes– J. Norton, Chairman

Materials: December 4, 2013, CAB Minutes

Mr. Nelson made a *Motion* that the Citizens' Advisory Board approve the Minutes from the December 4, 2013, meeting as written, seconded by Mr. Hooper. Hearing no further discussion, *Motion carried 5:0:0 (5 in favor, 0 opposed, 0 absent)*.

3. Consideration of Rate Adjustment – C. O'Brien, General Manager

Ms. O'Brien thanked Chair Norton and made some opening remarks. The RMLD is seeking an approximate 5% increase to meet more closely the approved FY14 Budget. The Operating Income for that Budget was approved at \$4.007m and with this rate increase of 5%, Operating Income would be \$3.4m. Ms. O'Brien clarified that when discussions first began on the need for the rate increase staff spoke both in terms of the overall increase to the customer's bill in addition to the percentage portions of the base rate that would be impacted. The 9% to the base portion and the customer charge is integral to the rate, but the effect is a 5% overall rate increase.

Ms. O'Brien noted the Operating Income is based on the kilowatt-hour sales projections, which over the last several years assumed unrealistic load growth - assumptions that were not adjusted in FY2014.

Massachusetts GL 58 does not allow RMLD to have rates that are below production costs - one of the reasons why we want to make sure that our operating income stays consistent - but also to protect our credit rating in order to continue to attract low power costs. RMLD has one of the lowest rates in the State and with this 5% increase will remain one of the lowest rates in the State. RMLD has excellent reliability, and with that, this type of rate increase is consistent with keeping Net Income at a 5.5% to 6.5% rate of return and allows us to meet all of our commitments and obligations.

Ms. O'Brien noted that this problem was found while going through the details of the budgets and preparing a six-year financial plan. To avoid this situation in the future, a six-year financial plan will be created each year. The cost of service study model will be updated, and we will remain consistent in our rate of return. Additionally, RMLD plans to unbundle the rates so as transmission and capacity prices go up it becomes even more transparent exactly where the increases may be coming from. Ms. O'Brien reported that all internal expenses have been reviewed, and there is not much, if anything, that can be changed immediately. Eighty percent of the RMLD budget is Power Supply and 20% is Operating and Maintenance (O&M). According to the American Public Power Association, 20% for O&M is excellent. This rate increase is to ensure that we meet our financial obligations and remain in financial standing until the end of this fiscal year.

Each CAB member was given an opportunity to speak about their experiences in presenting this proposed rate increase to their boards, town managers/administrators, and the public. CAB members acknowledged the efforts of the staff to meet with the various communities. They also acknowledged the excellent staff at RMLD. Some of the feedback CAB members received included questions about why this occurred, and how to avoid a similar situation in the future. There was concern about future rate increases as a result of the Cost of Service Study. Were there any red flags raised in terms of audits or financial reports that could have foreseen this? Questions were raised about the return on investment to the Town of Reading and the method to calculate that payment. Mr. Hooper noted (regarding the payment to Reading) that the benchmark was established by the Board of Commissioners back in 1998. Mr. Soli noted that the 2012 payment did go down when the CPI went down. Suggestions were made to either spread the rate increase out or delay it until the Cost of Service Study is complete. Concern was raised that this rate increase was originally presented without warning; its impact on citizens, both as taxpayers and rate payers.

Ms. O'Brien noted that there were load-growth assumptions that were not tracked closely. Revenue assumptions were made, and the sales were less than anticipated. With regard to the payment to the Town of Reading, Ms. O'Brien noted that in 1998 there was a Board of Commissioners motion to form a committee to look at that. The RMLD can make up to 8% of net plant, but targets to make less - to make the appropriate amount that balances solid financial standing and to meet our obligations and commitments. There must be a sufficient or appropriate amount of money for any type of catastrophic event whether affecting capital infrastructure or some kind of fuel crisis.

Ms. O'Brien noted that the Cost of Service Study will include both an LED street light rate and a low-income rate. Ms. O'Brien committed to continued education about what is anticipated noting that Transmission and Capacity increases are expected for 2017 and 2018. Ms. Parenteau explained, because RMLD is located in the NEMA load zone, capacity for that forward option cleared at \$15 a kilowatt month - right now, we are paying \$3 a kilowatt month. As a load entity in this area, we need generation in this area to meet that requirement. Therefore, we will be paying, on a net basis, around \$6 to \$7 a kilowatt month, which is doubling what we are currently paying for Capacity. Transmission is estimated to be increased at a rate of 10% per year for transmission upgrades that are regulated by FERC. Without a mechanism to manage our peak, there is no other way to hedge that. RMLD is working to get some programs in place to hedge some of these increases.

Ms. Parenteau spoke to past rate adjustments. Since the last rate increase in 2008, our power supply has decreased by \$9.5m. Those costs have been credited to our customers. Looking at RMLD rate comparisons over the last years, we were able to secure long-term contracts and those benefits were funneled all to our customers.

Chair Norton recognized Mr. Pacino and Mr. Mancuso who were present not as Commission members, but as members of the public. Each made statements.

Chair Norton opened the meeting for further discussion; hearing none asked for a motion.

Mr. Capobianco made a **Motion** that the RMLD Citizens' Advisory Board recommend to the RMLD Board of Commissioners the adoption of the rates MDPU numbers 228, 229, 230, 231, 232, 233, 234, 235 dated to be filed on January 30, 2014, on the recommendation of the General Manager, seconded by Mr. Ollila. **Motion failed 2:3:0 (2 in favor, 3 opposed, 0 absent).**

Chair Norton asked if there were any other motions.

Mr. Hooper made a **Motion** that the CAB recommend no increase in rates to the RMLD Board of Commissioners at this time until other options have been explored and identified, seconded by Mr. Nelson. **Motion carried 3:2:0 (3 in favor, 2 opposed, 0 absent).**

Chair Norton noted the three to two vote. Those in favor, Mr. Hooper, Chair Norton and Mr. Nelson. Those opposed, Mr. Capobianco and Mr. Ollila. The motion we will forward to the Board of Light Commissioners.

4. **Review of CAB Policy #1 – J. Norton, Chairman**

Materials: CAB Policy No. 1 Revision No. 1 (included in Packet) and Mr. Nelson's Edits (distributed).

Chair Norton turned discussion over to Mr. Nelson. Mr. Nelson reviewed the suggested changes as outlined on Revision 2 of Policy #1, which includes wording, issues as outlined in the 20-Year Agreement, some reference the 20-Year Agreement, applicable laws, using respect, and conducting ourselves in a business-like manner. Chair Norton asked for comments.

Mr. Ollila noted inconsistent references to the RMLD Board and the RMLD Commission. This should be consistent throughout. In addition, when using the word Board it is not clear who it references - the CAB or RMLD Board. Mr. Ollila questioned the language in III, Paragraph D, noting that the CAB sometimes looks at projects that are less than 10 megawatts. Do we need to change 10 to something else or address that? Also, it is not clear what the second two items are –six months in duration or one year in length. Chair Norton asked Ms. Parenteau to speak to that. Ms. Parenteau noted that she believes it is tied directly into the 20-Year Agreement and questioned whether it can change here and supersede the 20-Year Agreement. Mr. Ollila noted it states “all of the following conditions” or should it be, “or.” Mr. Ollila suggested (in Item E) after, “The CAB shall review the proposed budgets for both their ability to assure the proper maintenance...” – add “and reliability.” Mr. Soli suggested “subcommittees” be changed to committees. There were no other comments or suggestions. Chairman Norton asked that the revisions suggested be made and the Policy be put on the agenda for a formal vote. Mr. Nelson asked (regarding Page 1, I. Purpose, C and D) if anyone had any feelings about keeping that in there or taking it out. Chair Norton stated he had no problem with it staying in there. There were no other comments.

5. **Next Meeting Date – J. Norton, Chairman**

The next meeting of the CAB will be the Budget meetings: April 2 to review the Operating Budget held in Lynnfield, and April 9 to review the Capital Budget at RMLD.

6. **Executive Session – J. Norton, Chairman**

Mr. Hooper made a **Motion** that the Citizens' Advisory Board go into Executive Session based on Chapter 164, Section 47D exemption from public records and open meeting requirements in certain instances to approve Executive Session Minutes of December 4, 2013, to discuss competitively sensitive issues, and return to regular session for the sole purpose of adjournment, seconded by Mr. Nelson. **Motion carried 5:0:0 (5 in favor, 0 opposed, 0 absent), by a poll of members present:** Mr. Capobianco, aye; Mr. Hooper, aye; Chairman Norton, aye; Mr. Nelson, aye; Mr. Ollila, aye.

7. Motion to Adjourn – J. Norton, Chairman

Mr. Capobianco made a *Motion* to Adjourn the Citizens' Advisory Board meeting, seconded by Mr. Hooper. *Motion carried 5:0:0 (5 in favor, 0 opposed, 0 absent).*

The Citizens' Advisory Board Meeting adjourned at 7:59 p.m.

Respectfully submitted,

George Hooper, Vice Chair

Minutes approved on: _____

DRAFT

**READING MUNICIPAL LIGHT DEPARTMENT
CITIZENS' ADVISORY BOARD (CAB) MEETING**

**MINUTES
Regular Session**

Time: 6:30 p.m.
Date: Wednesday, April 9, 2014
Place: RMLD, 230 Ash Street, Reading, MA, Winfred Spur/Audio Visual Room

CAB Members Present:

Mr. George Hooper, Vice Chairman (Wilmington); Mr. Tony Capobianco (Reading); Mr. Dennis Kelley (Wilmington); Mr. David Nelson (Lynnfield)

CAB Members Absent:

Mr. John Norton, Chairman (North Reading)

RMLD Commissioner(s)/Guests Present:

Mr. Robert Soli, Board of Commissioners
Mr. Tom Ollila

RMLD Staff Present:

Ms. Coleen O'Brien, Mr. Hamid Jaffari, Mr. David Polson, Mr. Mark Uvanni, Ms. Kathleen Rybak

1. Call Meeting to Order – G. Hooper, Vice Chairman

Vice Chairman Hooper called the meeting of the Citizens' Advisory Board to order at 6:30 p.m. and noted that the meeting was being audio recorded.

2. Presentation of Meter Lamp – C. O'Brien, RMLD General Manager

Ms. O'Brien presented Mr. Tom Ollila with an RMLD meter lamp and thanked him for his service on the Citizens' Advisory Board.

3. FY15 CAPITAL BUDGET – C. O'Brien, General Manager

Materials: FY15 Capital Budget

Ms. O'Brien reported that the Reading Town Manager has asked for support for an electric vehicle charging station. RMLD does not currently have a formal program for this, but it is something that RMLD will consider supporting for all towns provided charging doesn't take place during peak hours.

Ms. O'Brien began the budget discussion by acknowledging the efforts of staff in preparing the Capital Budget. The focus of discussion at this meeting will be the FY15 budget, however, FY14 year-end projections are provided, as well projects being planned for FY16 through FY19. A brief description of each project is included on the "Planned Projects" spreadsheet.

Ms. O'Brien noted that she and Mr. Jaffari have done a system assessment and the focus items for FY15 include: building of the GIS, which is the mapping system which produces a geographically correct map of our system assets. Once updated the GIS is used as a basis for engineering modeling software that works to determine the accuracy of our system coordination and protection as well as future reliability planning, addressing capacity and flexibility to meet the challenges of the future. The second area is system maintenance. We are developing a predictive asset management system that is included in the budget, that we will tie into the GIS and will serve as a basis for assessing the current condition of our assets. The appropriate data loaded will support predictive maintenance to extend the life of the equipment and also to schedule replacements prior to any equipment failure. Ms. O'Brien reported that the LED streetlight

conversion is scheduled beginning in FY16 once the (FY15) Pilot is completed. Approximately 8,000 lights will be replaced at approximately \$3m. This will be a significant energy savings to each of the towns, and a decrease in maintenance to RMLD. Engineering is finalizing the pilot, which targets a number of areas within each town for piloting the lights.

Plant Value and Depreciation Expense is included on Page 2 of the "Planned Programs" spreadsheet. Ms. O'Brien noted that this six-year plan does not reflect any additional reliability issues which may be identified with the planned Reliability Study.

Ms. O'Brien referred to staff for project-specific presentations.

Facilities Management:

Mr. Polson presented Facilities department projects including those Continuing Project: the HVAC System Upgrade at 230 Ash Street and the Master Facilities Site Plan. New Projects scheduled for FY15 includes Oil Containment Facility Construction and Security Upgrades. Mr. Hooper asked if RMLD was in compliance with regulatory measures for oil storage. Mr. Polson noted that RMLD is in compliance; these are precautionary measures to enhance some facilities and minimize exposure. Moving on to Annual Projects, Mr. Polson reviewed the rolling stock replacement. Staff has conducted a review and assessment of the vehicles to ensure we are using our vehicles effectively and make some efforts to reduce the fleet. The fleet has been reduced by 6 (including trailers and vehicles). An 8 to 10-year plan has been developed for replacing vehicles. The group discussed the utilization and maintenance of the vehicles, as well as the process for evaluating vehicles for replacement.

MIS:

Mr. Uvanni reviewed the Capital Budget items for the MIS department. An upgrade to the Great Plains/Cogsdale system, is planned for FY15. This is RMLD's main business management software used for customer service management, billing, meter management functions, credit and collections, and service orders. This is a major project which will include a business-process review, system testing, and specialized staff training.

Mr. Uvanni presented the Annual Projects (Hardware Upgrades, and Software and Licensing Upgrades). Hardware Upgrades include a focus to create more virtualized machines in order to consolidate servers. RMLD will also be purchasing a new GIS server. Software and Licensing includes custom programming for various systems. RMLD will be moving to Office 365, which is subscription based. Mr. Uvanni noted that a SharePoint (intranet) site will be developed.

System:

Mr. Jaffari reviewed the progress on the Continuing Projects which will carry over into FY15 (included on pages 27-39 in the Budget). Mr. Hooper asked what the Department considers when planning for future (load) growth. Mr. Jaffari responded that the Reliability Study will identify the load growth and load centers in various areas. That will provide a good idea of how RMLD should re-route circuits and create more ties, transfer load, or maybe build more substations that will support the system into the next 20 years. Mr. Jaffari noted that based on his preliminary assessment, RMLD will likely need to build another substation in Wilmington to accommodate anticipated load growth. The group discussed the methodology for predicting load and distribution.

Mr. Jaffari then continued his presentation with review of the New Projects for FY15 (included on pages 42-61). System Annual Projects that are items budgeted annually (included on pages 63-78) were then reviewed.

In conclusion, Ms. O'Brien noted that staff will continue to work to get the road map and the GIS completed in order to be more comfortable with the status of the system, and to stay ahead of the curve (on maintenance) and to plan in anticipation of future load growth.

Mr. Nelson made a **Motion** that the **Citizens' Advisory Board recommend to the RMLD** Board of Commissions the FY15 Capital Budget, dated March 28, 2014, in the amount of \$5,849,673,000, as presented and any significant changes are to be submitted to the CAB for reviewed and recommendation. ***Motion carried 4:0:1 (4 in favor, 0 opposed, 1 absent).***

4. Election of Secretary – G. Hooper, Vice Chairman

Mr. Hooper accepted nominations for the office of Secretary which was vacated by Mr. Ollila. Mr. Kelley made a motion to nominated Mr. Nelson as Secretary, seconded by Mr. Capobianco. Mr. Nelson accepted the nomination. ***Motion carried 4:0:1 (4 in favor, 0 opposed, 1 absent).***

5. Coverage for Board of Commissioners Meetings – G. Hooper, Vice Chairman

Mr. Kelley will replace Mr. Ollila on the schedule for coverage of the Commissioners Meetings (April and October meetings).

6. Next Meeting – G. Hooper, Vice Chairman

Next meeting of the CAB was scheduled for May 8th at 5:30 pm at the RMLD building. The Agenda for that meeting will be presentation of the Cost of Service Study. An additional CAB meeting will be scheduled after the presentation to consider any rate changes.

7. Motion to Adjourn – G. Hooper, Vice Chairman

Mr. Nelson made a ***Motion*** to Adjourn the Citizens' Advisory Board meeting, seconded by Mr. Kelley. Hearing no further discussion, ***Motion carried 4:0:1 (4 in favor, 0 opposed, 1 absent).***

The Citizens' Advisory Board Meeting adjourned at 8:34 pm.

Respectfully submitted,

George Hooper, Vice Chairman

As approved on: _____



Town of Reading Meeting Minutes

Board - Committee - Commission - Council:

RMLD Citizens Advisory Board

Date: 2015-04-15

Time: 6:30 PM

Building: Wilmington Town Hall

Location: Room 9

Address: 121 Glen Road, Wilmington, MA

Purpose: Regular Meeting

Session: General Session

Attendees: **Members - Present:**

Mr. George Hooper, Chair (Wilmington); Mr. David Mancuso, Secretary (Reading); Mr. Mark Chrisos (North Reading); Mr. Dennis Kelley (Wilmington)

Members - Not Present:

Mr. David Nelson, Vice Chair (Lynnfield)

Others Present:

Mr. Thomas O'Rourke, RMLD Board of Commissioners
Ms. Coleen O'Brien, Mr. Bob Fournier, Mr. Hamid Jaffari, Ms. Jane Parenteau,
Ms. Kathleen Rybak, Mr. Mark Uvanni

Minutes Respectfully Submitted By: George Hooper, Chair

Topics of Discussion:

1. Call Meeting to Order – G. Hooper, Chair

Chair Hooper called the meeting of the Citizens' Advisory Board to order at 6:30 p.m. and noted that the meeting was being audio recorded.

2. Pole Line Upgrade –Lowell Street, Wilmington – H. Jaffari, Director of Engineering & Operations

Mr. Jaffari provided an update on the Lowell Street, Wilmington project. This project calls for upgrading the pole line from Woburn Street up. This project requires upgrade to approximately 35 poles; fifteen poles have been set and five transfers completed thus far. Mr. Jaffari estimates another seventy days of work to complete the project by the end of June or early July. Winter weather delayed the project. Mr. Jaffari acknowledged the cooperation from the Town of Wilmington, in particular the DPW Director and crews, who provided a backhoe for snow removal, which has resulted in a substantial savings during the project.

Mr. Hooper noted that it is going relatively smoothly given the amount of traffic that flows through that area. Mr. Kelley asked about the time-frame for other utilities (Comcast and Verizon) to complete their work. Mr. Jaffari noted that they will be notified through NJUNS (pole transfer system) once RMLD work is completed.

3. FY16 Capital Budget - C. O'Brien, General Manager

Presentation Materials: FY2016 Capital Budget CAB and RMLD Board Presentation

Ms. O'Brien introduced staff present. Ms. O'Brien reported that RMLD is presenting the budget for FY16, which is integral to the six-year capital outlay including the FY15 year-end estimate and potential FY15 to FY16 carryovers. RMLD began using this format last year. With this format, you are seeing what we think we will accomplish in this year and what we have planned out in the future. As the Organizational and Reliability Study and the roadmaps and strategic plans roll

out, you'll start to see that that five-year plan lines up and everyone always has an idea of where we are going so that it's transparent.

The FY15 Budget was an aggressive year of change where a number of projects worked holistically to layout the roadmap for the future of RMLD. This included calling for the full Organizational and Reliability study; the development of the new Technical Services division that now handles all of the substation maintenance and testing, including underground wire testing; asset management maintenance plans and corresponding system equipment that's needed. The FY16 budget continues this path with a master facilities plan, fleet assessment study, major substation and circuit upgrades, LED street light conversion through all the towns, peak shaving and system flexibility functions, GIS overhaul including complete data collection, and SCADA integration. As well, our main finance software (Cogsdale) upgrade, security and spill prevention measures, 500 Club metering. As everyone is familiar, we have a fixed network for all our residential. Those meters were purchase without an ability to provide the parameters back for the data to the SCADA or for engineering modeling. Therefore, we stopped for the 500 Club and are putting in a mesh network that integrates into the fiber loop. This will improve our capability to communicate with all of our customers and will also allow us to provide the new demand response capability program, which is a sharing in the cost-benefit with our customers to curtail load during peak shaving time-frames.

The Capital Budget for FY16 represents approximately \$10.5m, of which approximately \$1.5m was previously approved (with prior budgets) and transferred.

Mr. Chrisos asked for an overview of how projects are selected for FY16 versus future years – what factors (such as return on investment) are considered. Ms. O'Brien responded that we laid out the roadmap of what needs to be done. For example with circuit upgrades, capacity needs in a particular area, or equipment at the end of its useful life, a new substation. There are force accounts with the State, and some projects are added for compliance purposes. Projects such as distributed generation (DG) or the HVAC system consider the return on investment. Mr. Jaffari added, with the long-range planning study, good GIS and system modeling you will identify the weak points in the system and prioritize work (and spending) in a proactive manner.

Mr. Kelley asked if the Organizational/Reliability studies had been completed and if the studies were used to create this budget. Ms. O'Brien responded that the reports had just been received and are under review and revision. When the Budget was put together staff did the analysis and prioritized work. Ms. O'Brien noted that Booth created a GIS model of just the main bones and they did their modeling with the GIS model and came back with 95% match of what RMLD had done manually.

Mr. Jaffari reviewed the FY16 Capital Authorization Major Spending Projects (Slide 3). The projects highlighted in green are projects that were endorsed by the Reliability Study. Project highlights of the presentation include:

- Station 4 Switchgear's Breaker Replacement - the breakers and the gut of the system is antiquated. RMLD will begin to upgrade the equipment to prevent failure.
- Distributed Generation – A unit will be proposed for Station 3 as a mechanism for RMLD to manage anticipated increases in transmission and capacity costs. ROI will be 5-6 years. Mr. Chrisos asked if someone could comment on reports that ISO New England is thinking about changing the way they charge capacity factors. Ms. Parenteau responded that the ISO has talked about that several times. However, should they change the rules, RMLD could always put the generation in front of the meter so that energy could be generated into the marketplace. The preference is to stay behind the meter so we are not subject to generation rules. However, with an investment such as this, there are areas where we can maximize the benefit. Mr. Chrisos noted that as this project advances, RMLD will need to communicate with the North Reading Town Manager so that everyone in Town knows it's coming. Mr. Jaffari agreed and noted that the Town of North Reading would be briefed on the project.
- Substation Equipment Upgrade – RMLD will upgrade the relays to get them ready for the grid modernization.
- LED Street Lights - This project will start this year and run for three years. RMLD has received a \$125,000 grant from the DOER for this project.
- GIS – the foundation for the grid modernization and system upgrade and planning.
- Step-down Upgrades – When Substation 3 was built, RMLD had to convert the area and had to use step-downs. We are working to remove them, which will benefit the system by cutting down the losses.

- URD Upgrades – upgrade to old underground facilities.
- Routine Construction – includes general area build up, and residential/commercial buildings that are being constructed in the communities.
- Transformers and Capacitors – for routine use and to replace aged transformers.
- Rolling Stock - fork lift, spreader, digger derrick truck, and the tech services van.
- AMI Metering for 500 Club – The project will start in April through December. Meters will be installed at the commercial locations.
- MIS – upgrades to servers and software

Ms. O'Brien asked Mr. Fournier to discuss how (since we are going above our depreciation expense) RMLD will fund these projects. Mr. Fournier responded that for FY16, we believe we can internally finance FY16's Capital Budget. Based on our carry-over from FY15 (which is our ending balance or the beginning balance for FY16), then adding in depreciation and our year-end transfer, and if we spend everything we say we are going to in FY16, we may need to use the rate stabilization fund. Mr. Fournier noted that he called the DPU and they said that that is the appropriate for the use of rate stabilization money. If we did all of that, we would be able to internally finance this Capital Budget. If we do not want to borrow from rate stabilization, the ending balance as of FY16 is about \$3m, and we could use that \$3m. As Ms. O'Brien and Mr. Jaffari mentioned, with the Reliability Study a lot of the focus is to get these things done immediately - hence the \$10m. If you look at the rest of the plan, it is hovering around \$7m which is doable

Mr. Chrisos noted this is the highest year we're going to have and questioned, since we have such an excellent credit rating and the cost of money is so reasonable at this point, if we considered taking one or two large projects and bonding them because of the favorable rate of return now versus what we are going to get back. Mr. Fournier responded that the budget is prepared at the beginning of the (calendar) year, and we only have seven months of actual data. Until we get the FY15 numbers finalized, we really won't know exactly where we stand. We might not need to go out to bond. Once we get the FY15 results, we will look at where we stand. Another option is to increase the depreciation rate, but that adds additional expense on the bottom line.

Mr. Mancuso asked about the budget for transformers and what the \$668k covers in terms of the 20-25 year plan to replace aged transformers; how many will we actually be able to get done. Mr. Jaffari responded that we have prioritized the transformers by age. Last year, we replaced approximately 250 transformers. We estimate 200 maximum per year. This budget number is for both the transformer replacement and some of the other projects including new business. The majority will be used for the transformer upgrades. The group discussed the transformer replacement schedule and what is being spent to replace aged transformers versus the monetary and environmental risk of failures. Mr. Jaffari noted that we are proactively upgrading and replacing transformers that we think need to be replaced in the order of priority based on age and condition. This is a 10 to 15-years program and we can expect to see this kind of expense in the Capital Budget for the next 10 to 15 years.

Mr. Jaffari continued review of the remaining presentation slides addressing Operational Efficiencies and Purchase Power Savings (slide 4); Organizational and Reliability Study and Reliability Study Deficiencies (slide 5); RMLD's newly developed programs and plans (slide 6); Reliability Study Recommendations (slide 7); RMLD Organizational Study Deficiencies and Recommendations (slide 8). Ms. O'Brien noted that these are all recommendations or best practices at this point. Staff will talk about these recommendations more to see what actually could work within RMLD's current staffing structure. Mr. Jaffari noted that these are the highlights of the reports, more detail will follow once the full reports are provided.

Ms. Parenteau continued the presentation with a Distributed Generation (DG) Cost Benefit Analysis (slide 9-11). In order to give the Boards some numbers behind the \$2.1m of distributed generation, a cost-benefit analysis was prepared that looks at three alternatives including natural gas fueled distributed generation (DG), battery-based energy storage and solar-photovoltaic (PV). To make a base case, RMLD assumed a \$2.1m budget (the cost for two megawatts of DG) and apply that to each technology. Staff used very conservative numbers, and looked at variable costs, fixed costs, and debt service as outlined on Slide 11.

Ms. Parenteau reiterated that we are looking at this as a pilot for peak reduction (for both capacity and transmission reduction). Capacity is currently at \$3 and projected to go to \$15 by 2017. Transmission is around \$8 and is escalating at an average of over 6%. Ms. Parenteau noted that RMLD is trying to implement programs to off-set those increases. Ms. Parenteau

noted that all of these applications are great in a portfolio approach. However, what RMLD is trying to do is take the value, in terms of our customer revenue, and utilize the best option in the current time. RMLD supports solar and battery storage initiatives (right now battery storage is a little bit cost prohibitive). RMLD is currently working with customers on solar and we think this would be a natural progression in terms of implementing ways to manage our peak demand. The current peak reduction programs are voluntary. RMLD is working with commercial customers, but we rely on them to take an action. If they don't take that action, we don't get that reduction. By installing an application like this, we achieve that savings and that savings gets rolled out to everybody. Typically, RMLD's average kilowatt hour sales are about 700m kilowatt hours. That annual savings divided will correlate (for an average residential customer who uses 750 kilowatt) to a little over \$5.50 savings for that customer (26,000 residential customers). For our large commercial customers, this would provide significant savings in terms of the amount of energy that they utilize on an annual basis.

Mr. Mancuso asked if there was any capacity to run beyond peaking? Ms. Parenteau responded that it could, depending on gas availability, and permitting of the resource and how it is dispatched. Mr. Mancuso asked about the ongoing operating expenses and projected life cycle of the unit. Ms. Parenteau responded, that there's not much (operating expense) because it's based on run time; an annual inspection of the unit at approximately \$12,000. Life cycle is dependent on the run hours. These units can last well over 25 years. It is capital, which increases our net plant.

The group discussed the challenges of addressing the increases in transmission and capacity costs while balancing the portfolio with green/renewal energy, which tends to be expensive. As RMLD considers this gas-generated source, we need to be sensitive to the public concerns and be prepared to address those concerns. The group agreed that DG would be the right way to go as a pilot and then re-examine it in a year.

Mr. Jaffari noted that the presentation portion of the meeting was completed and asked if there were any questions.

Mr. Chrisos referenced recent press releases in the North Reading Transcript about the community solar and asked if there was a plan for press releases moving forward that is going to continue the story? Ms. Parenteau responded that there is a series of articles planned to address various topics (an introductory article, transmission costs rising, energy and capacity, and community solar). Mr. Chrisos asked for an update on the community solar project that's advancing through the Reading Climate Advisory Board. Ms. O'Brien responded that they are helping RMLD to try to locate facilities that might be willing to look at the structural integrity of their roof. Ms. Parenteau noted that community solar in general gets a higher SREC value, but because we are limited with land in this area, we are trying to tap municipal buildings first, so that the towns get a benefit in terms of the lease payment or payment in lieu of taxes, as well as visibility in the community. Ms. Parenteau reported that RMLD met with members of the Reading Planning department, and the MAPC and they are going to do some structural evaluation of some facilities that are options in Reading. Mr. Chrisos asked about the North Reading High School. Ms. Parenteau noted that RMLD is inundated with solar developers that come talk to us on a weekly basis. However, another solar developer had a proposal to North Reading that was brought to the selectmen who were not ready to consider it due to the timing (just after completion of the High School).

Mr. O'Rourke asked about the plan for spending with the capital expense - is it front loaded in the fiscal year; what does the cash flow look like? Mr. Fournier responded that the funds would be available and referred to Mr. Jaffari for a timeline. Mr. Jaffari noted that funds were going to be spent through the year. If the distributed generation is approved by the Board, we would like to get that started as soon as possible in order to get it completed before next year's peak so that we can start seeing the benefits. For some of the projects, such as AMI, the funds are needed right away.

Mr. Mancuso asked that the CAB have a conversation at some point about the budget review process moving forward. Mr. Mancuso noted he does not like the process of approving the Capital Budget before looking at the revenue side and load forecasting to completely understand what the money coming in is as we are making these decisions. Mr. Mancuso noted that he would like to see a unified budget because it's very difficult to go back and forth and really understand the capital expense side and then the operating side. Chair Hooper noted that he agrees on the operating budget and would like to have that presented first. Mr. Kelley suggested delaying the

Capital Budget vote until after the Operating Budget presentation. Mr. Mancuso indicated the he was not inclined to hold off the vote, what he would like is a different process in the future. Chair Hooper asked if there were any suggested motions.

Mr. Mancuso made a **Motion** that that the Citizens' Advisory Board recommend to the RMLD Board of Commissioners the FY16 Capital Budget dated March 27, 2015, in the amount of \$10,596,000 as presented. Any significant changes are to be submitted to the CAB for review and recommendation. Motion was seconded by Mr. Mancuso. Hearing no further discussion, **motion carried 4:0:1** (4 in favor; 0 opposed, 1 absent).

The group continued the discussion about the budget process and presentation moving forward, as well as, the impact on RMLD revenue of economic development within the communities.

4. Next Meeting - G. Hooper, Chair

The next CAB meeting will be held April 22, 2015, at 6:30 p.m. at RMLD.

5. Motion to Adjourn – G. Hooper, Chair

Mr. Mancuso made a **Motion** to adjourn the Citizens' Advisory Board meeting, seconded by Mr. Chrisos. **Motion carried 4:0:1 (4 in favor, 0 opposed, 1 absent).**

The Citizens' Advisory Board Meeting adjourned at 8:17 p.m.

Minutes Approved On: _____

DRAFT



Town of Reading Meeting Minutes

Board - Committee - Commission - Council:

RMLD Citizens Advisory Board

Date: 2015-04-22

Time: 6:30 PM

Building: Reading Municipal Light Building

Location: Winfred Spurr Audio Visual Room

Address: 230 Ash Street

Purpose: Regular Meeting

Session: General Session

Attendees: **Members - Present:**

Mr. George Hooper, Chair (Wilmington); Mr. David Mancuso, Secretary (Reading); Mr. Mark Chrisos (North Reading); Mr. Dennis Kelley (Wilmington)

Members - Not Present:

Mr. David Nelson (Lynnfield)

Others Present:

Mr. Dave Talbot, Board of Commissioners
Ms. Coleen O'Brien, Mr. Robert Fournier, Mr. Hamid Jaffari, Ms. Jane Parenteau, Ms. Kathleen Rybak

Minutes Respectfully Submitted By: Mr. George Hooper, Chair

Topics of Discussion:

1. Call Meeting to Order – G. Hooper, Chair

Chair Hooper called the meeting of the Citizens' Advisory Board to order at 6:30 p.m. and noted that the meeting was being audio recorded.

2. FY16 Operating Budget – C. O'Brien, General Manager

Ms. O'Brien welcomed the CAB to part two of the RMLD Budget presentation, which will feature the Operating Budget. Ms. O'Brien acknowledge the discussion at the April 15th CAB meeting regarding the budget process and noted at the end of this presentation any feedback on the process would be welcome.

Ms. O'Brien began the presentation stating the six-year plan provides an overview of where RMLD stands (for FY15) with eight months actual and four months of budgeted figures. The CAB will be voting on the 2016 Budget, and six-year plan shows projections for FY17-20, so that we will always be looking ahead so that we do not get into a situation where growth expectations are not being met and updated. Ms. O'Brien noted that staff reviews the budget against actual monthly to make sure that we are on target. Also, since last year the rates have been unbundled (for base sales of electricity). In FY16, RMLD is budgeting \$23m in base revenue, which must cover operating expense, maintenance expense and the depreciation expense. With the unbundled rate we can now see how we are covering those expenses.

Mr. Kelley asked how the first eight months of FY15 compare to the first eight months of last year. Ms. Parenteau noted that on the revenue side, sales are down. Last year we had kilowatt-hour sales of around \$689m, and this year we are projecting to come in around \$675m. Last year, we were down about 2%. We are anticipating being below last year, and therefore, assumed flat sales during the budgeting process.

Mr. Chrisos asked about large jump (in operating revenue) between FY19 and 20 (15.0%). Mr. Fournier noted that Chapter 164 allows us to earn 8%. If you look at O&M, operating and maintenance expense are growing at 3% a year. In order for us to get close to our 8% (give or take), everything else being equal (we get all our capital additions number every year, which effects depreciation expense, and our town payments to the four towns) we are saying, we need to have base revenue grow by this amount. The further out the less we know about what's going to be out there. However, if expenses are growing at 3%, and we are saying we only need about 2-2.5% base revenue growth, at some point you are going to have a shortfall ~~to pay the piper~~, or you build into it along the way.

Ms. O'Brien continued, noting that we've learned in this last year and half (with sales going down) that we have to push towards the 8% rate of return to cover the capital. Other utilities can make 8% of gross, but we can only make 8% of net, so there is not a lot of margin to collect enough money when sales start to go down. Ms. O'Brien reported that the consultant said that benchmarking for operating ratio is at 85% and that provides the utility the ability to recover during periods of downward sales. This benchmark is utility practice and a strong recommendation. RMLD's operating ratio is approximately 96%. When considering the 8% of net, almost 50% goes to the Town of Reading (and going up every year by the CPI). The below the line obligations are significant. Above the line, \$1.4m is going to all the towns.

Mr. Mancuso asked about the historical rate of return up until this point. Ms. O'Brien responded that it would fluctuate. It would start of at about 6.5% and at the end of the year it would come in at 5.9%. Now, we are starting closer to 8% and will probably come in around 6.5%. In the past, there were growth projections that did not come to fruition. They were projecting a 6% return, it was coming in at less than 3%, and then getting closer to 2%. That is why we unbundled the rates, why we do the six-year plan, and have monthly staff meetings just on these values, to make sure that we are covering expense. It is better fiduciary duty in not cutting it so thin.

Mr. Chrisos commented that a policy issue really is how RMLD will continue to grow the customer base. It is something the Commission should consider. The CAB has talked about it in general, but it really is a separate discussion. Ms. O'Brien noted that it is very important to work with the towns; what we need and what they want might be a little bit different. Ms. O'Brien cited some of the work staff has been doing with Osram in Wilmington and with the Reading Economic Development team to consider development of the property behind Ash Street. Mr. Mancuso suggested this topic be an Agenda item for the CAB. The CAB as individual community representatives, as opposed to the Commission, which has to represent all the communities, can help in this process. Maybe the CAB can play a role in helping to broaden the conversation and start to help communities understand the long-term impact on rates if we don't grow load or identify other revenue streams. Mr. Talbot added, that RMLD could consider offering telecom services through fiber internet connections. Mr. Talbot stated that this is an area that he has been studying in his day job (not about RMLD), and then provided some background on what some other MLPs in the state are doing with telecom services. Mr. Talbot noted it is something that should be in the long-term plan and should start with a study committee, which would identify what the need is.

Moving back to the Budget, Ms. O'Brien noted that by maximizing the operating ratio, as also discussed in the strategic plan, it provides the utility the ability to recover during periods of downward sales. This benchmark is a utility practice and a strong recommendation. Ms. O'Brien noted that she has told the towns that there would not be any last-minute rate increases; every May and November you should expect something; rates either go up or down. Ms. O'Brien noted that she would like to change the RMLD budget to a calendar year. RMLD would then have our numbers ready so that the towns would know what to expect for their budgeting purposes. Ms. O'Brien reported that she notified the towns to expect about a 4-6% (overall) rate increase in July. The cost of service model will be run every year, we'll decide what's going to happen around this timeframe, and that will roll into the July (budgets). A full cost of service study will be done every three years.

Ms. O'Brien turned the presentation over to Ms. Parenteau. Ms. Parenteau noted that she will focus on Revenue. In order for RMLD to get to that 8% (operating ratio), we have to get to that \$23m in base revenue. The only way we can get there is if we have growth, or an increase in our rates. Ms. Parenteau noted that power supply is a pass-through; costs for base capacity, base transmission, and fuel are passed along to customers. As the actuals for these expenses come in, Integrated Resources trues up to those costs, reforecasts, and adjusts the rates accordingly. The goal at the end of the year is to have our base revenue and our base expenses net out to zero.

This (zeroing out) does not always happen due to the nature of sales. Looking at the budget, the sum of those three (base capacity, base transmission and fuel) minus the NYPA (a contra-revenue against the fuel), will exactly equal to our operating expenses associated with base capacity, base transmission, and fuel. Purchase power (those three components) and our budget-to-actual (as of the drafting of this budget) appear to be flat (0.75% differential). Gas prices between the time we did this budget and today, have come down between 2% and 5%, which effects the fuel. But, again, it's a pass-through, so it doesn't really impact the bottom line. But it does impact the bottom line to RMLD consumers because it is a pass-through. For budgeting purposes on revenue, staff looked at the rates and the various classes of customers and made assumptions on their usage. With the existing rates and customer classes, it works out to be on average a 3% overall increase (assuming a decrease of 1% in sales). We are anticipating \$675m (for FY15), and for the FY16 budget we used \$668m.

Mr. Chrisos asked about power supply increased forecasted in the budget through 2020.

Ms. Parenteau summarized some of the anticipated pricing changes in purchase power (capacity, transmission, and fuel) including the impact of the natural gas supply on these costs. IRD is trying to develop programs that will minimize those peak demand charges (which is how RMLD is billed). In summary, Ms. Parenteau noted that about 75% of Operating Revenue represents the pass through (on purchase power) and 25% represents the base (to cover operating expenses).

Mr. Fournier presented the operating (expense) portion of the Budget, noting the Operating Budget is not a line item budget; which means if you see "x" amount of dollars next to one account, our hands are not tied to spend that amount – one good storm could impact a budget very easily. RMLD has to provide electricity; we cannot say we're over budget – wait till next year before you get your power back on. Mr. Fournier reviewed Slide 4, which summaries the total expenses in the FY16 Operating Budget totaling \$86.5m. Of that \$86.4m, nearly \$72m (or 83%) of the Budget is fixed costs (as outlined). The semi-variable costs, which is about \$14.5m represents about 17% of the budget. Mr. Fournier reviewed the semi-variable expenses, noting labor and employee pension/benefits is net of what is included in the capital projects (for the labor). Groups (all) at \$1.8m is the next large item and represents each department's unique expenses, which are needed for that department to function.

Ms. Parenteau spoke about the Conservation Programs, which are set at \$1m per kilowatt hour. On average RMLD collects approximately \$700,000 per year, which is ear-marked for conservation programs, including some expenses related to salaries for those engineers working with customers. RMLD has been without an efficiency engineer for about two years (a new person is coming on board May 18), therefore, that fund is currently a little robust. Ms. Parenteau provided a high-level review of some of the rebate programs intended to incentivize customers to conserve energy.

Mr. Jaffari reviewed the Tree Trimming costs, noting the tree trimming program has moved from a time-and-materials program to a per-span reimbursement program, which is more efficient. RMLD will work on a three-year cycle with the strategy of trimming main roads/switches first and then the laterals. The tree-trimming schedules will be included on the RMLD website. Chapter 87 requires we provide official IVM (Integrated Vegetation Management) Plans to each of the towns. These are now completed and will be sent to town tree wardens, administrators, and DPW directors. Staff will then meet with all the communities and tree wardens.

Mr. Jaffari went on to review Overtime expense. Per union contract, RMLD is obligated, to provide eight hours overtime to line department staff, when the an RMLD contractor is in our territory working. RMLD will be terminate the current underground construction contract as of September 1. However, we will utilize them as needed for specific jobs. This should reduce the overtime spending. Staff is tracking planned vs. unplanned overtime. Unfortunately, unplanned overtime (storms, motor vehicle accidents, etc.) drives overtime expenses up. Another factor which will impact overtime, are the long overdue maintenance programs, which may require overtime work depending on the severity of issues.

Mr. Jaffari continued with a review the training expense. As a result of the Reliability and Organizational Studies, RMLD will be providing more workforce training to bring staff up-to-date with the most recent technology, acceptable system design, and codes. Ms. O'Brien reviewed some other initiatives for training that are being implemented such as train-the-trainer, more on-site training (rather than sending staff out), inviting other utilities to share training (and costs), and utilization of vendors for free training.

Mr. Fournier continued the review of Semi-Variable Costs: property insurance; professional services (consultants, legal fees); office supplies, which, per FERC code, includes banking charges including credit card fees; vehicle repair and maintenance; rent expense; transformer hazardous spills; bad debt; injuries and damage; and the RMLB and CAB expenses.

Staff addressed questions from the CAB members regarding specific expense items including medical benefit costs, insurance costs, the impact of conservation programs on load/sales, overtime, maintenance programs and how they impact reliability statistics.

Ms. O'Brien updated the CAB on the Organizational and Reliability Studies. Based on the request of the Commissioners, Ms. O'Brien will be meeting with the commissioners one-on-one (no deliberations), to review the reports. There will then be a staff presentation by the consultants on the May 14, and on the evening of the May 14 there will be a presentation at the Board of Commissions meeting. Ms. O'Brien invited CAB members to attend.

Mr. Fournier continued the presentation with a review of the Staffing Report (slide 5). Current staffing is at 70.25. One IRD co-op position (with no benefits) is added in the FY16 budget. The second column reflects the vacancies. These positions were approved for FY15 but have not been filled; they are included in the FY16 budget. Ms. O'Brien noted that some of these positions are vacancies that carried over, not necessarily new positions.

Mr. Fournier stated that he had concluded his presentation of the Operating Budget and asked if there were any questions. There were no questions.

Ms. O'Brien noted that there were no positions in the Budget that were based on recommendations in the Organizational Study. If there are positions that they highly recommend (by the study), staff may have to come back and talk about that. Mr. Chrisos asked what the study recommended (regarding staffing). Mr. Jaffari reported that the study noted staffing shortages for engineering (5-6 people); Human Resources, and Accounting. Mr. Chrisos asked if the study spoke about a Health and Safety professional. Ms. O'Brien responded that we have a Human Resources person, and the Facilities Manager position, which is currently vacant, is the head of the Safety Committee; RMLD has a General Safety Committee and an Operational Safety Committee.

Mr. Christo made a **Motion** that the Citizens' Advisory Board recommend to the RMLD Board of Commissioners the FY16 Operating Budget with a Net Income of \$3,012,070 as presented, seconded by Mr. Mancuso. Hearing no further discussion, **Motion carried 4:0:1 (4 in favor, 0 opposed, 1 absent)**.

Chair Hooper thanked the staff for their work in preparing the budget, and then opened discussion on the format for the annual budget presentation and discussion. Mr. Hooper noted that he likes the format, but suggested presentation of the Operating Budget ahead of the Capital Budget. Mr. Mancuso agreed, but noted that one unified document would be helpful, with presentation of the revenue and operations before the capital portion. Mr. Kelley asked if members wanted to continue with two separate meetings. The group agreed two meetings would foster open conversation.

3. Next Meeting – G. Hooper, Chair

The next meeting of the CAB was scheduled for May 20th.

Ms. O'Brien asked Mr. Chrisos how he would like to proceed with Town discussions around the Distributed Generator. Mr. Chrisos asked that a meeting be set up once the Board of Commissioners approves the Budget.

4. Motion to Adjourn – G. Hooper, Chair

Mr. Chrisos made a **Motion** to Adjourn the Citizens' Advisory Board meeting, seconded by Mr. Chrisos. **Motion carried 4:0:1 (4 in favor, 0 opposed, 1 absent)**.

The Citizens Advisory Board Meeting adjourned at 7:57 pm.

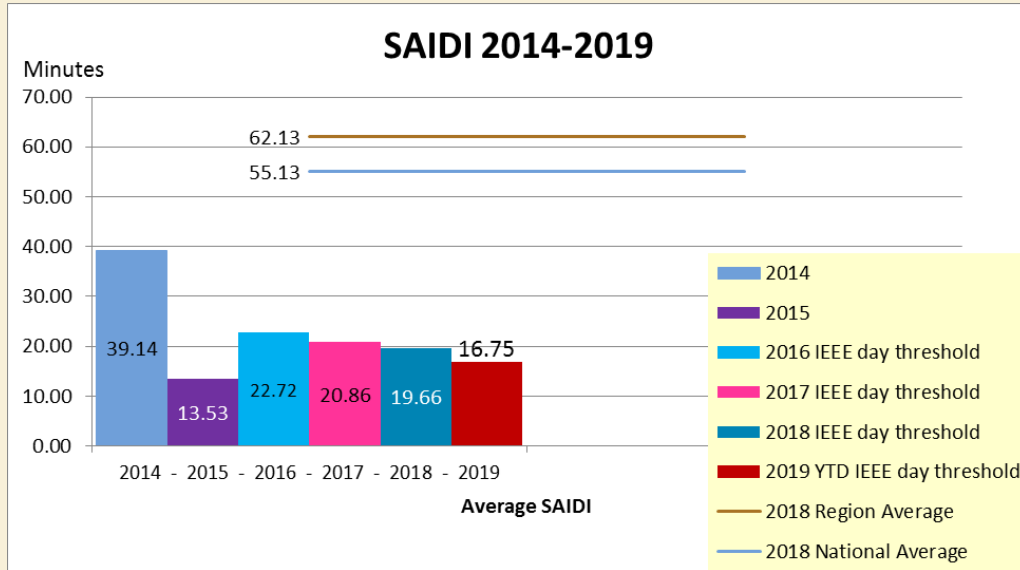
Minutes Approved On: _____

Reliability Update

Hamid Jaffari, Director of Engineering & Operations

Citizens' Advisory Board Meeting
September 19, 2019

RMLD Reliability Indices



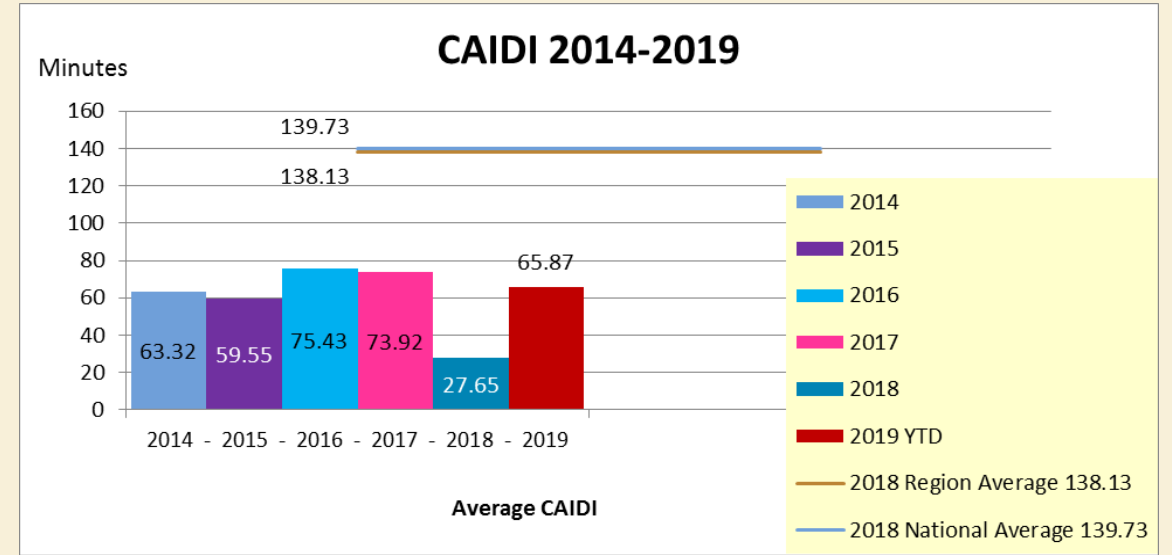
$$SAIDI \text{ (Minutes)} = \frac{\text{Total Duration of Customer Interruptions}}{\text{Total Number of Customers Served}}$$

Note: The major event (ME) threshold allows a utility to remove outages that exceed the IEEE 2.5 beta threshold for events. These events could be severe weather, which can lead to unusually long outages in comparison to your distribution system's typical outage.

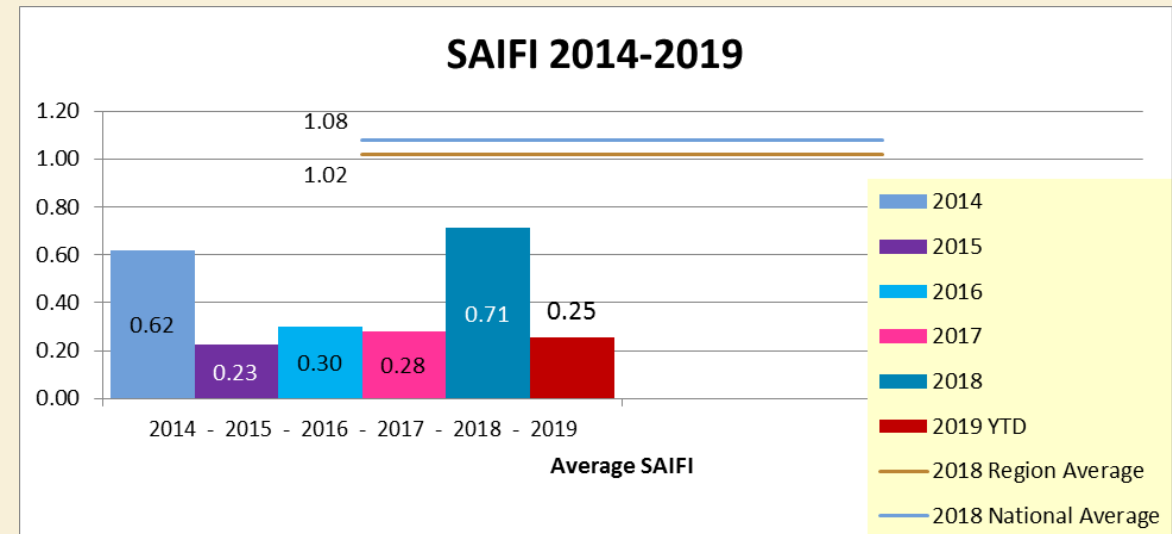
$$SAIFI = \frac{\text{Total Number of Customer Interruptions}}{\text{Total Number of Customers Served}}$$

Regional and national averages have been updated for 2018.

2019 data from January through August



$$CAIDI \text{ (Minutes)} = \frac{\text{Total Duration of Customer Interruptions}}{\text{Total Number of Customers Interruptions}}$$



Outages

