

# Combustion Turbine

CT1 – Lodi / Alameda

## FY 2018 Proposed Budget

February 9, 2017

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## Assumptions

- Capacity Value \$30/KW-Yr
- Projects Identified Based on 10 Year Operation
  - Perform turbine maintenance based on condition only
  - Defer availability projects
- Permit Limited Operation

# FY 2018 – CT1 Proposed Budget

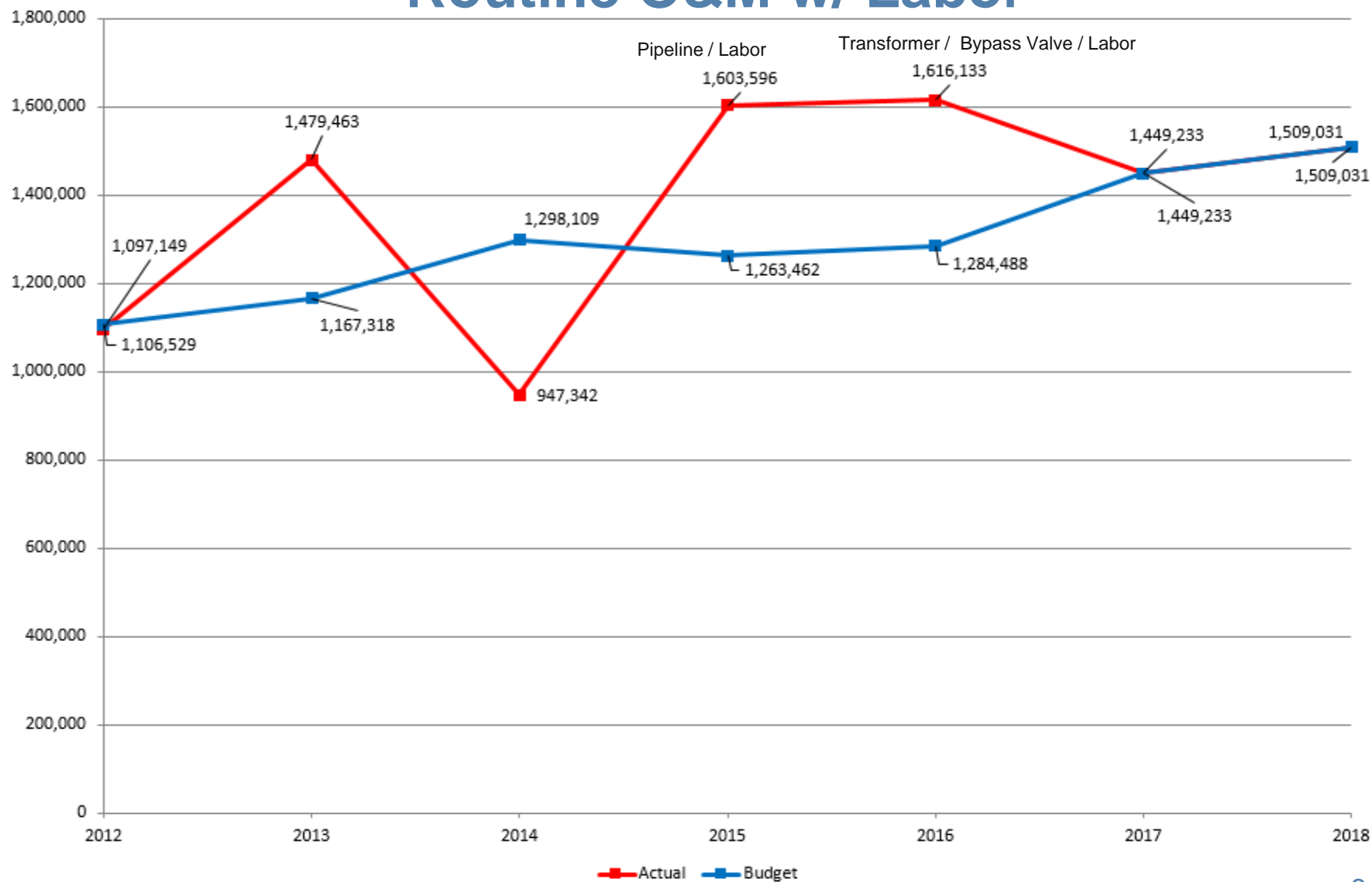
|                                    | FY 2016<br>Budget | FY 2016<br>Actual | FY 2017<br>Budget | Proposed<br>FY 2018<br>Budget | Increase/<br>(Decrease) |
|------------------------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------------|
| <b>Routine Variable Costs</b>      |                   |                   |                   |                               |                         |
| Variable O&M                       | \$10,040          | \$14,018          | \$10,040          | \$10,261                      | \$221                   |
| Fuel                               | \$0               | \$219,101         | \$173,911         | \$189,367                     | \$15,456                |
| CAISO Charges (Variable)           | 5,670             | 50,305            | 1,030             | 587                           | (443)                   |
| <b>Total VOM</b>                   | <b>15,710</b>     | <b>283,424</b>    | <b>184,981</b>    | <b>200,215</b>                | <b>15,234</b>           |
| MWHr                               | 0                 | 3,360             | 1,167             | 1,514                         |                         |
| \$/MWHr                            | 0                 | 84                | 159               |                               |                         |
| <b>Routine Fixed Costs</b>         |                   |                   |                   |                               |                         |
| Fixed                              | 397,749           | 416,327           | 407,140           | 420,720                       | 13,580                  |
| Administration                     | 40,693            | 43,774            | 43,285            | 44,017                        | 732                     |
| Mandatory Costs                    | 153,500           | 137,695           | 159,818           | 159,921                       | 103                     |
| Inventory                          | 0                 | 0                 | 45,000            | 45,000                        | 0                       |
| <b>Total Routine Fixed Costs</b>   | <b>591,942</b>    | <b>597,796</b>    | <b>655,243</b>    | <b>669,659</b>                | <b>14,416</b>           |
| <b>Unplanned Expenses</b>          | <b>0</b>          | <b>133,093</b>    | <b>0</b>          | <b>0</b>                      | <b>0</b>                |
| <b>Labor</b>                       | <b>682,506</b>    | <b>871,226</b>    | <b>793,990</b>    | <b>839,372</b>                | <b>45,382</b>           |
| <b>Non-Variable Routine Total</b>  | <b>1,274,448</b>  | <b>1,602,115</b>  | <b>1,449,233</b>  | <b>1,509,031</b>              | <b>59,798</b>           |
| <b>Total Routine O&amp;M Costs</b> | <b>1,290,158</b>  | <b>1,885,539</b>  | <b>1,634,214</b>  | <b>1,709,245</b>              | <b>75,031</b>           |

Transformer /  
Control Security /  
Bypass Valve

# FY 2018 – CT1 Proposed Budget

|                                    | FY 2016<br>Budget | FY 2016<br>Actual | FY 2017<br>Budget | Proposed<br>FY 2018<br>Budget | Increase/<br>(Decrease) |
|------------------------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------------|
| <b>Total Routine O&amp;M Costs</b> | <b>1,290,158</b>  | <b>1,885,539</b>  | <b>1,634,214</b>  | <b>1,709,245</b>              | <b>75,031</b>           |
| <b>Other Costs</b>                 |                   |                   |                   |                               |                         |
| Debt Service                       | 0                 | 0                 | 0                 | 0                             | 0                       |
| Other Costs                        | 138,678           | 112,143           | 116,904           | 113,442                       | (3,462)                 |
| Generation Services Shared         | 61,919            | 47,978            | 57,864            | 61,831                        | 3,967                   |
| Administrative & General           | 312,360           | 331,092           | 314,348           | 350,654                       | 36,306                  |
| <b>Total Other Costs</b>           | <b>512,957</b>    | <b>491,213</b>    | <b>489,116</b>    | <b>525,927</b>                | <b>36,811</b>           |
| <b>Total O&amp;M Costs</b>         | <b>1,803,115</b>  | <b>2,376,752</b>  | <b>2,123,330</b>  | <b>2,235,172</b>              | <b>111,842</b>          |
| <b>Projects</b>                    |                   |                   |                   |                               |                         |
| Operations & Maintenance           | 1,074,200         | 870,446           | 0                 | 20,000                        | 20,000                  |
| Capital                            | 0                 | 0                 | 0                 | 0                             | 0                       |
| Maintenance Reserve                | 0                 | 0                 | 525,000           | 525,000                       | 0                       |
| <b>Total Projects Costs</b>        | <b>1,074,200</b>  | <b>870,446</b>    | <b>525,000</b>    | <b>545,000</b>                | <b>20,000</b>           |
| <b>Annual Budget Cost</b>          | <b>2,877,315</b>  | <b>3,247,198</b>  | <b>2,648,330</b>  | <b>2,780,172</b>              | <b>131,842</b>          |
| Revenue                            | 71,877            | 597,719           | 55,906            | 118,990                       | 63,084                  |
| <b>Net Cost to Members</b>         | <b>2,805,438</b>  | <b>2,649,479</b>  | <b>2,592,424</b>  | <b>2,661,182</b>              | <b>68,758</b>           |
| Capacity Cost (\$/KW-Yr)           |                   | 35                | 35                | 35                            |                         |

## Routine O&M w/ Labor



■ FY17 is forecast in the Actual trend line

|   |       |         |
|---|-------|---------|
| O&M Projects                                | Notes |         |
| Gas Compressor Lubricators                  | D     | 20,000  |
|   | Total | 20,000  |
| Capital Projects                            | Notes |         |
|   | Total | 0       |
| Maintenance Reserve                         | Notes |         |
| Fuel Nozzle Refurbishment                   |       | 30,000  |
| Gas Line Emergency Stop                     |       | 50,000  |
| Other ( CB Maint, GG Work, Insulator Maint) |       | 50,000  |
|   | Total | 130,000 |



# FY 2018 – CT1 Gas Compressor Lubricators

| Project                        | Notes | Total Cost | FY 2016 | FY 2017 | FY 2018  | FY 2019 |
|--------------------------------|-------|------------|---------|---------|----------|---------|
| CT1 Gas Compressor Lubricators | D     | \$20,000   |         |         | \$20,000 |         |

## Notes:

|    |                                       |
|----|---------------------------------------|
| D  | Discretionary                         |
| M  | Mandatory                             |
| CR | Annual deposit to the Capital Reserve |

| AFE Financial Measurements | Value | Units     |
|----------------------------|-------|-----------|
| NPV @ Discount Rate        | 4,130 | \$        |
| IRR                        | 8.9%  | %         |
| Average Annual Benefits    | 2,877 | \$        |
| Payback                    | 6     | Years     |
| Useful Life                | 10.0  | Years     |
| B/C Ratio                  | 1.21  | B/C Ratio |

- Maintain Critical Lubrication Supply
- Correct High Failure Rate Component
- If probability of failure >10%, economic project.
- 30 years old, one of three has failed.
- 168 hours outage, 2 units





## FY 2018 – CT1 Proposed Projects

| Maintenance Reserve                         | Notes |         |
|---|-------|---------|
| Fuel Nozzle Refurbishment                   |       | 30,000  |
| Gas Line Emergency Stop                     |       | 50,000  |
| Other ( CB Maint, GG Work, Insulator Maint) |       | 50,000  |
| Total                                       |       | 130,000 |

# FY 2018 – CT1 Parts Refurbishment

| Project                 | Notes | Total Cost | FY 2016 | FY 2017 | FY 2018  | FY 2019 |
|-------------------------|-------|------------|---------|---------|----------|---------|
| CT1 Parts Refurbishment | D     | \$30,000   |         |         | \$30,000 |         |

## Notes:

|    |                                       |
|----|---------------------------------------|
| D  | Discretionary                         |
| M  | Mandatory                             |
| CR | Annual deposit to the Capital Reserve |

| AFE Financial Measurements | Value  | Units     |
|----------------------------|--------|-----------|
| NPV @ Discount Rate        | 56,975 | \$        |
| IRR                        | 49.7%  | %         |
| Average Annual Benefits    | 8,698  | \$        |
| Payback                    | 2.0    | Years     |
| Useful Life                | 10.0   | Years     |
| B/C Ratio                  | 2.9    | B/C Ratio |



|    |    |           |           |       |                 |
|----|----|-----------|-----------|-------|-----------------|
| 1  | 1  | Worn/Wear | Pass      | Pass  |                 |
| 2  | 2  | Crack     | Pass      | Fail  | Replace part    |
| 3  | 3  | groove    | Pass      | Pass  | Polish Tip O.D. |
| 4  | 4  | Worn/Wear | Pass      | Pass  |                 |
| 5  | 5  | Worn/Wear | Pass      | Pass  |                 |
| 6  | 6  | Crack     | Pass      | Fail  | Replace part    |
| 7  | 7  | Crack     | Pass      | Fail  | Replace part    |
| 8  | 8  | Crack     | Pass      | Fail  | Replace part    |
| 9  | 9  | Worn/Wear | Worn/Wear | Crack | Pass            |
| 10 | 10 | Worn/Wear | Worn/Wear | Crack | Pass            |

- Required for outage planned in 2020
- Re-Stock Essential Parts
  - (Fuel Nozzle refurbishment
- Back up for U2 which is showing signs of increasing temperature spreads
- Reduce future outage duration as these are 14 weeks for refurbishment
- Saves 7 weeks

# FY 2018 – CT1 Gas Line Emergency Stop

| Project        | Notes | Total Cost | FY 2016 | FY 2017 | FY 2018  | FY 2019 |
|----------------|-------|------------|---------|---------|----------|---------|
| Emergency Stop | S     | \$50,000   |         |         | \$50,000 |         |

## Notes:

|   |               |
|---|---------------|
| D | Discretionary |
| M | Mandatory     |
| S | Safety        |

| AFE Financial Measurements | Value | Units     |
|----------------------------|-------|-----------|
| NPV @ Discount Rate        | 0     | \$        |
| IRR                        | 5.0%  | %         |
| Average Annual Benefits    | 2,000 | \$        |
| Payback                    | 7.0   | Years     |
| Useful Life                | 10.0  | Years     |
| B/C Ratio                  | 1.00  | B/C Ratio |

- No remote method to isolate either Lodi or Alameda plants from gas supply
- Detected leaks would require drive to site to isolate.
- Potentially hazardous situation for employees and may not be able to isolate.



# FY 2018 – CT1 Other Maintenance

| Project           | Notes | Total Cost | FY 2016 | FY 2017 | FY 2018  | FY 2019 |
|-------------------|-------|------------|---------|---------|----------|---------|
| Other Maintenance | D     | \$50,000   |         |         | \$50,000 |         |

## Notes:

|    |                                       |
|----|---------------------------------------|
| D  | Discretionary                         |
| M  | Mandatory                             |
| CR | Annual deposit to the Capital Reserve |

| AFE Financial Measurements | Value | Units     |
|----------------------------|-------|-----------|
| NPV @ Discount Rate        | 0     | \$        |
| IRR                        | 5.0%  | %         |
| Average Annual Benefits    | 2,000 | \$        |
| Payback                    | 7.0   | Years     |
| Useful Life                | 10.0  | Years     |
| B/C Ratio                  | 1.00  | B/C Ratio |

- Circuit Breaker Maintenance
- Additional Ground Grid lines
- Insulator Maintenance



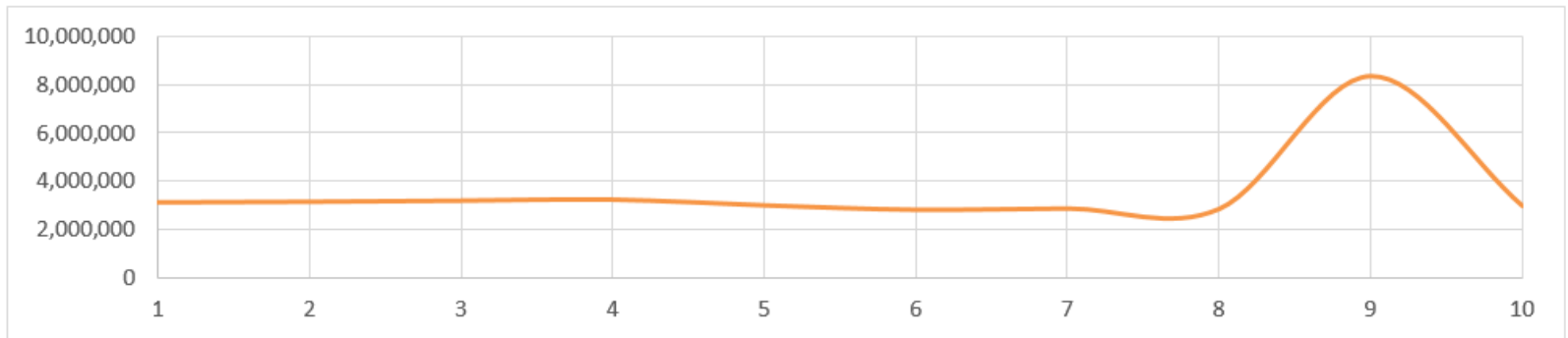
# FY 2018– CT1 Project Forecast

Operate until 2025, Option to Continue

|   | FY 2018        | FY 2019          | FY 2020          | FY 2021        | FY 2022        | FY 2023        | FY 2024        | FY 2025        | FY 2026          | FY 2027        |
|---|----------------|------------------|------------------|----------------|----------------|----------------|----------------|----------------|------------------|----------------|
| <b>O &amp; M PROJECTS</b>                   |                |                  |                  |                |                |                |                |                |                  |                |
| Gas Compressor Lubricators                  | 20,000         |                  |                  |                |                |                |                |                |                  |                |
| <b>TOTAL O&amp;M PROJECTS</b>               | <b>20,000</b>  | <b>0</b>         | <b>0</b>         | <b>0</b>       | <b>0</b>       | <b>0</b>       | <b>0</b>       | <b>0</b>       | <b>0</b>         | <b>0</b>       |
| <b>CAPITAL PROJECTS</b>                     |                |                  |                  |                |                |                |                |                |                  |                |
| <b>TOTAL CAPITAL PROJECTS</b>               | <b>0</b>       | <b>0</b>         | <b>0</b>         | <b>0</b>       | <b>0</b>       | <b>0</b>       | <b>0</b>       | <b>0</b>       | <b>0</b>         | <b>0</b>       |
| <b>RESERVE FUND SPENDING</b>                |                |                  |                  |                |                |                |                |                |                  |                |
| BEGINNING YEAR BALANCE                      | 460,000        | 855,000          | 1,090,000        | 215,000        | 37,000         | 270,000        | 260,000        | 260,000        | 250,000          | 250,000        |
| Annual Outage, Routine Maint                | 130,000        | 280,000          | 125,000          | 553,000        | 0              | 0              | 0              | 0              | 2,458,830        | 0              |
| Turner CT and Gen Maint                     | 0              | 10,000           | 75,000           | 75,000         | 0              | 10,000         | 0              | 10,000         | 1,250,000        | 10,000         |
| ALA1 CT and Gen Maint                       | 0              | 0                | 75,000           | 75,000         | 0              | 0              | 0              | 0              | 1,250,000        | 0              |
| ALA2 CT and Gen Maint                       | 0              | 0                | 1,125,000        | 0              | 0              | 0              | 0              | 0              | 450,000          | 0              |
| <b>TOTAL RESERVE FUND SPENDING</b>          | <b>130,000</b> | <b>290,000</b>   | <b>1,400,000</b> | <b>703,000</b> | <b>0</b>       | <b>10,000</b>  | <b>0</b>       | <b>10,000</b>  | <b>5,408,830</b> | <b>10,000</b>  |
| ADDITIONAL FUNDING                          | 525,000        | 525,000          | 525,000          | 525,000        | 233,000        | 0              | 0              | 0              | 5,408,830        | 10,000         |
| <b>END OF YEAR BALANCE</b>                  | <b>855,000</b> | <b>1,090,000</b> | <b>215,000</b>   | <b>37,000</b>  | <b>270,000</b> | <b>260,000</b> | <b>260,000</b> | <b>250,000</b> | <b>250,000</b>   | <b>250,000</b> |
| <b>TOTAL O&amp;M, ALL PROJECTS, FUNDING</b> | <b>545,000</b> | <b>525,000</b>   | <b>525,000</b>   | <b>525,000</b> | <b>233,000</b> | <b>0</b>       | <b>0</b>       | <b>0</b>       | <b>5,408,830</b> | <b>10,000</b>  |

# FY 2018– CT1 10 Year Net Cost to Member

|                               | FY 2018   | FY 2019   | FY 2020   | FY 2021   | FY 2022   | FY 2023   | FY 2024   | FY 2025   | FY 2026   | FY 2027   |
|-------------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| O&M Projects                  | 20,000    | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         |
| Capital Projects              | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         |
| Maintenance Reservice Funding | 525,000   | 525,000   | 525,000   | 525,000   | 233,000   | 0         | 0         | 0         | 5,408,830 | 10,000    |
| O&M Costs                     | 2,054,031 | 2,095,111 | 2,137,013 | 2,179,754 | 2,223,349 | 2,267,816 | 2,313,172 | 2,359,435 | 2,406,624 | 2,454,757 |
| A&G                           | 525,927   | 536,446   | 547,174   | 558,118   | 569,280   | 580,666   | 592,279   | 604,125   | 616,207   | 628,531   |
| Revenues                      | 9,645     | 12,658    | 21,644    | 33,534    | 29,003    | 35,869    | 39,172    | 116,717   | 109,816   | 126,846   |
| Net Cost to Members           | 3,115,313 | 3,143,898 | 3,187,543 | 3,229,338 | 2,996,626 | 2,812,613 | 2,866,279 | 2,846,844 | 8,321,846 | 2,966,442 |
| Capacity Cost (\$/KW-Yr)      | 42        | 42        | 43        | 43        | 40        | 38        | 38        | 38        | 111       | 40        |





# Combustion Turbine

CT2 – STIG

FY 2018 Proposed Budget

February 9, 2017



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## CT2 Assumptions

- Capacity \$30/KW-Yr
- Debt paid in 2026
- Air New Zealand expects to service LM5000 until 2018
- Expected STIG will retire in 2026 or shortly thereafter
- Repower Options
  - Estimate \$50mm +100%
  - NPV -\$38mm
  - IRR -4.1%
- Decommissioning, no estimates at this time
- Maintenance / Project Plan based on 9 remaining years

# FY 2018 – CT2 Proposed Budget

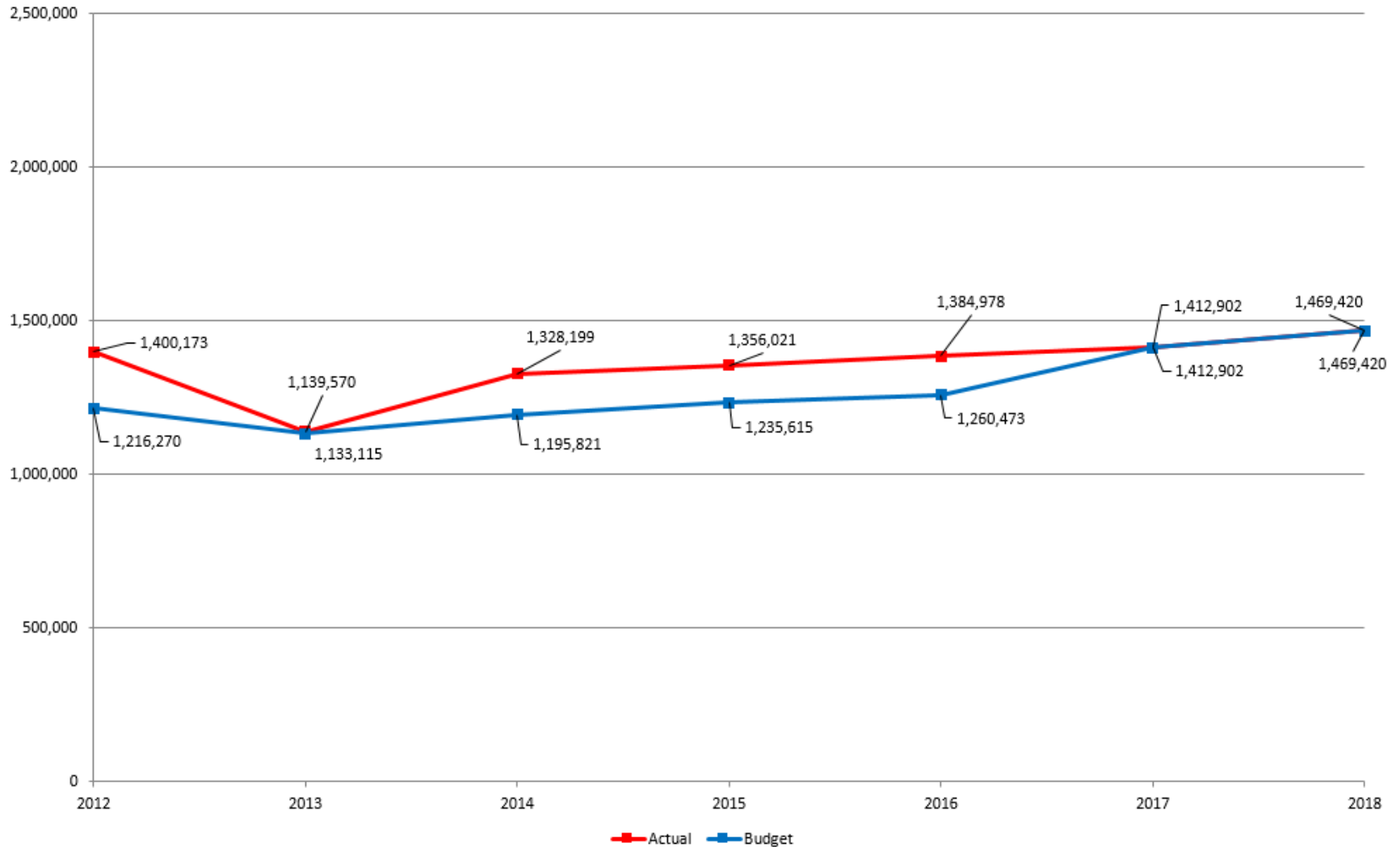
|                                    | FY 2016<br>Budget | FY 2016<br>Actual | FY 2017<br>Budget | Proposed<br>FY 2018<br>Budget | Increase/<br>(Decrease) |
|------------------------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------------|
| <b>Routine Variable Costs</b>      |                   |                   |                   |                               |                         |
| Variable O&M                       | \$84,300          | \$83,646          | \$86,700          | \$88,607                      | \$1,907                 |
| Fuel & Pipeline Net Transport      | \$489,583         | \$14,535          | \$521,052         | (\$3,467)                     | (\$524,519)             |
| CAISO Charges (Variable)           | 1,241             | 39,595            | 2,289             | 463                           | (1,826)                 |
| <b>Total VOM</b>                   | <b>575,124</b>    | <b>137,776</b>    | <b>610,041</b>    | <b>85,603</b>                 | <b>-524,438</b>         |
| MWHR                               | 688               | 3,299             | 2,339             | 1,196                         |                         |
| \$/MWHR                            | 836               | 42                | 261               | 72                            |                         |
| <b>Routine Fixed Costs</b>         |                   |                   |                   |                               |                         |
| Fixed                              | 412,367           | 550,241           | 433,425           | 444,801                       | \$11,376                |
| Administration                     | 53,545            | 32,502            | 53,178            | 54,276                        | \$1,098                 |
| Mandatory Costs                    | 71,200            | 59,137            | 79,235            | 79,389                        | \$154                   |
| Inventory                          | 0                 | 0                 | 15,000            | 15,000                        | \$0                     |
| <b>Total Routine Fixed Costs</b>   | <b>537,112</b>    | <b>641,880</b>    | <b>580,838</b>    | <b>593,466</b>                | <b>12,628</b>           |
| <b>Unplanned Expenses</b>          | <b>0</b>          | <b>0</b>          | <b>0</b>          | <b>0</b>                      | <b>\$0</b>              |
| <b>Labor</b>                       | <b>639,061</b>    | <b>659,452</b>    | <b>745,364</b>    | <b>788,185</b>                | <b>42,821</b>           |
| <b>Non-Variable Routine Total</b>  | <b>1,176,173</b>  | <b>1,301,332</b>  | <b>1,326,202</b>  | <b>1,381,651</b>              | <b>55,449</b>           |
| <b>Total Routine O&amp;M Costs</b> | <b>1,751,297</b>  | <b>1,439,108</b>  | <b>1,936,243</b>  | <b>1,467,254</b>              | <b>-468,989</b>         |



# FY 2018 – CT2 Proposed Budget

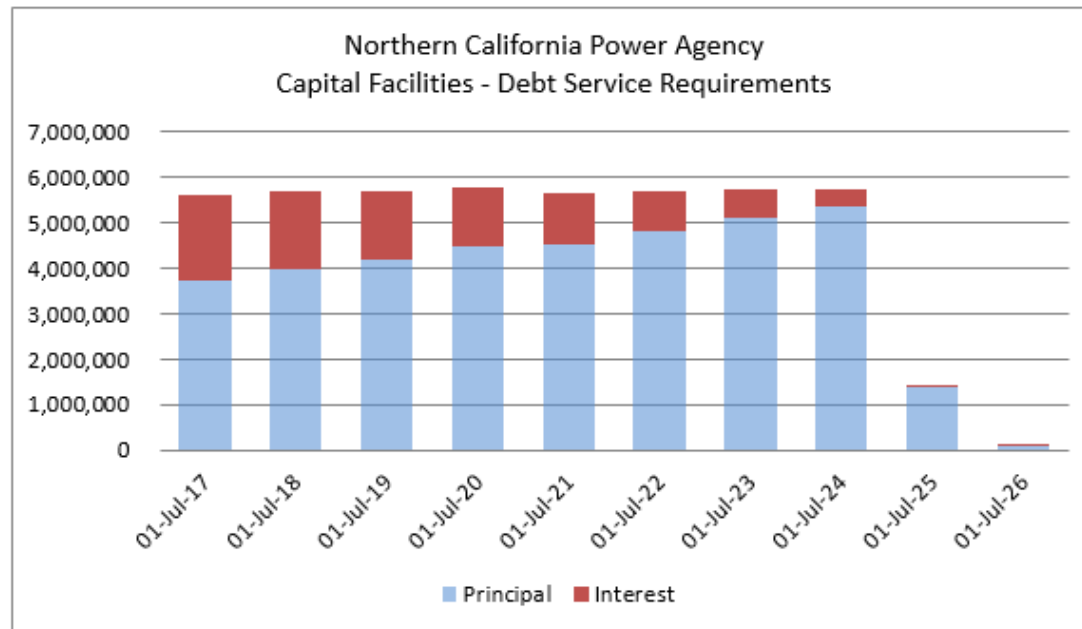
|                                    | FY 2016<br>Budget | FY 2016<br>Actual | FY 2017<br>Budget | Proposed<br>FY 2018<br>Budget | Increase/<br>(Decrease) |
|------------------------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------------|
| <b>Total Routine O&amp;M Costs</b> | <b>1,751,297</b>  | <b>1,439,108</b>  | <b>1,936,243</b>  | <b>1,467,254</b>              | <b>-468,989</b>         |
| <b>Other Costs</b>                 |                   |                   |                   |                               |                         |
| Debt Service                       | 5,679,515         | 5,679,515         | 5,625,568         | 5,692,922                     | 67,354                  |
| Other Costs                        | 105,415           | 114,518           | 87,033            | 85,351                        | (1,682)                 |
| Generation Services Shared         | 57,980            | 36,615            | 54,249            | 57,966                        | 3,717                   |
| Administrative & General           | 293,365           | 280,230           | 336,127           | 292,262                       | (43,865)                |
| <b>Total Other Costs</b>           | <b>6,136,275</b>  | <b>6,110,878</b>  | <b>6,102,977</b>  | <b>6,128,501</b>              | <b>25,524</b>           |
| <b>Total O&amp;M Costs</b>         | <b>7,887,572</b>  | <b>7,549,986</b>  | <b>8,039,220</b>  | <b>7,595,755</b>              | <b>(443,465)</b>        |
| <b>Projects</b>                    |                   |                   |                   |                               |                         |
| Operations & Maintenance           | 80,060            | 90,042            | 30,000            | 121,348                       | 91,348                  |
| Capital                            | 0                 | 0                 | 103,000           | 0                             | (103,000)               |
| Maintenance Reserve                | 0                 | 0                 | 0                 | 0                             | 0                       |
| <b>Total Projects Costs</b>        | <b>80,060</b>     | <b>90,042</b>     | <b>133,000</b>    | <b>121,348</b>                | <b>(11,652)</b>         |
| <b>Annual Budget Cost</b>          | <b>7,967,632</b>  | <b>7,640,028</b>  | <b>8,172,220</b>  | <b>7,717,103</b>              | <b>(455,117)</b>        |
| Revenue                            | 70,820            | 304,120           | 300,297           | 131,724                       | (168,573)               |
| <b>Net Cost to Members</b>         | <b>7,896,812</b>  | <b>7,335,908</b>  | <b>7,871,923</b>  | <b>7,585,379</b>              | <b>(286,544)</b>        |
| Capacity Cost (\$/KW-Yr)           | 158               | 147               | 157               | 152                           |                         |

# Routine O&M w/ Labor



■ FY17 is forecast in the Actual trend line

# Debt Service Requirements



| PERIOD ENDING | PRINCIPAL           | INTEREST           | TOTAL               |
|---------------|---------------------|--------------------|---------------------|
| 7/1/2017      | 3,752,500           | 1,873,068          | 5,625,568           |
| 7/1/2018      | 3,975,417           | 1,717,505          | 5,692,922           |
| 7/1/2019      | 4,178,333           | 1,538,375          | 5,716,708           |
| 7/1/2020      | 4,465,417           | 1,331,004          | 5,796,421           |
| 7/1/2021      | 4,545,000           | 1,107,733          | 5,652,733           |
| 7/1/2022      | 4,834,167           | 880,483            | 5,714,650           |
| 7/1/2023      | 5,125,833           | 627,638            | 5,753,471           |
| 7/1/2024      | 5,370,000           | 358,531            | 5,728,531           |
| 7/1/2025      | 1,375,000           | 76,606             | 1,451,606           |
| 7/1/2026      | 84,167              | 4,419              | 88,585              |
|               | <u>\$37,705,833</u> | <u>\$9,515,363</u> | <u>\$47,221,196</u> |

## FY 2018– CT2 Proposed Projects

| O&M Projects                               | Notes |         |
|--|-------|---------|
| DCS Software Upgrade (Contract Yr 3 of 3)  | M     | 30,000  |
| PG&E / NCPA Share Relay Replacement        | M     | 11,348  |
| Rebuild Bellows                            | S     | 50,000  |
| STIG 480V MCC Breaker Maintenance (15.13%) | M     | 30,000  |
| Total                                      |       | 121,348 |

| Capital Projects | Notes |   |
|------------------|-------|---|
| Total            |       | 0 |

| Maintenance Reserve | Notes |   |
|---------------------|-------|---|
| Total               |       | 0 |



# FY 2018 – CT2 DCS Operating System

| Project              | Notes | Total            | FY 2016        | FY 2017 | FY 2018 | FY 2019 |
|----------------------|-------|------------------|----------------|---------|---------|---------|
|                      |       | Cost to Complete | Current Budget |         |         |         |
| DCS Operating System | D     | \$150,000        | 90,000         | 30,000  | 30,000  | 0       |

| AFE Financial Measurements | Value  | Units     |
|----------------------------|--------|-----------|
| NPV @ Discount Rate        | 13,593 | \$        |
| IRR                        | 7.8%   | %         |
| Average Annual Benefits    | 15,938 | \$        |
| Payback                    | 3.0    | Years     |
| Useful Life                | 10.0   | Years     |
| B/C Ratio                  | 1.09   | B/C Ratio |

## Notes:

- D Discretionary
- M Mandatory
- Annual deposit to the Capital
- CR Development Reserve

- Approved Project in 2015
- FY16/17 Complete, HMI Installation Successful
- FY2017-18, Final Year Agreement

# FY 2018 – PGE Relay Replacement

| Project            | Notes | Total Cost | FY 2016 | FY 2017 | FY 2018  | FY 2019 |
|--------------------|-------|------------|---------|---------|----------|---------|
| PG&E Relay Upgrade | D     | \$75,000   |         |         | \$75,000 |         |

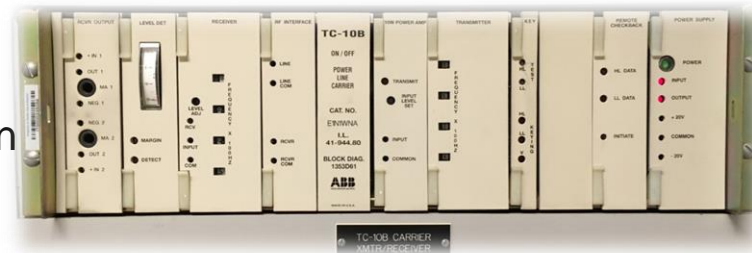
Shared (CT2 = \$11,347;  
LEC=\$63,653)

## Notes:

|    |                                       |
|----|---------------------------------------|
| D  | Discretionary                         |
| M  | Mandatory                             |
| CR | Annual deposit to the Capital Reserve |

| AFE Financial Measurements | Value    | Units     |
|----------------------------|----------|-----------|
| NPV @ Discount Rate        | (75,000) | \$        |
| IRR                        | 0.0%     | %         |
| Average Annual Benefits    | 0        | \$        |
| Payback                    | 30.0     | Years     |
| Useful Life                | 30.0     | Years     |
| B/C Ratio                  | 0.00     | B/C Ratio |

- PGE Replacement Program for obsolete, unsupported Relays.
- Equipment type is demonstrating high failure rates on their system.
- Fault clearing too slow.
- Construction (demolition, installation)
- Commissioning (relay testing and PGE witness testing)



# FY 2018 – CT2 Rebuild Bellows

| Project            | Notes | Total Cost | FY 2016 | FY 2017 | FY 2018  | FY 2019 |
|--------------------|-------|------------|---------|---------|----------|---------|
| CT2 Repack Bellows | S     | \$50,000   |         |         | \$50,000 |         |

## Notes:

|    |                                       |
|----|---------------------------------------|
| D  | Discretionary                         |
| M  | Mandatory                             |
| CR | Annual deposit to the Capital Reserve |

| AFE Financial Measurements | Value | Units       |
|----------------------------|-------|-------------|
| NPV @ Discount Rate        |       | 0 \$        |
| IRR                        |       | 0 %         |
| Average Annual Benefits    |       | 0 \$        |
| Payback                    |       | 0 Years     |
| Useful Life                |       | 0 Years     |
| B/C Ratio                  |       | 0 B/C Ratio |

- Repack Bellows and Mitigate Hot Gas Leak
- Fabric has deteriorated



# FY 2018 – CT2 Breaker Maintenance

| Project                     | Notes | Total Cost | FY 2016 | FY 2017 | FY 2018  | FY 2019 |
|-----------------------------|-------|------------|---------|---------|----------|---------|
| CT2 480 Breaker Maintenance | S     | \$30,000   |         |         | \$30,000 |         |

## Notes:

|    |                                       |
|----|---------------------------------------|
| D  | Discretionary                         |
| M  | Mandatory                             |
| CR | Annual deposit to the Capital Reserve |

| AFE Financial Measurements | Value | Units       |
|----------------------------|-------|-------------|
| NPV @ Discount Rate        |       | 0 \$        |
| IRR                        |       | 0 %         |
| Average Annual Benefits    |       | 0 \$        |
| Payback                    |       | 0 Years     |
| Useful Life                |       | 0 Years     |
| B/C Ratio                  |       | 0 B/C Ratio |

- 480 VAC Breaker Maintenance
- Maintenance to ensure proper operation of breakers to eliminate
  - Faulting
  - Arcing
  - Hot spots / fire
  - Shock



# FY 2017– CT2 Project Forecast

|   | FY 2018        | FY 2019       | FY 2020  | FY 2021       | FY 2022  | FY 2023       | FY 2024  | FY 2025  | FY 2026       | FY 2027           |
|---|----------------|---------------|----------|---------------|----------|---------------|----------|----------|---------------|-------------------|
| <b>O &amp; M PROJECTS</b>                   |                |               |          |               |          |               |          |          |               |                   |
| High Energy Pipe Inspection                 |                |               |          | 15,000        |          |               |          |          | 17,500        |                   |
| Repack HRSG Bellows                         | 50,000         |               |          |               |          |               |          |          |               |                   |
| STIG 480V MCC Breaker Maintenance           | 30,000         |               |          |               |          | 35,000        |          |          |               |                   |
| Ammonia System Major Maintenance            |                |               |          | 30,000        |          |               |          |          | 6,000         |                   |
| Water Plant VFDs                            |                | 30,000        |          |               |          |               |          |          |               |                   |
| <b>TOTAL O&amp;M PROJECTS</b>               | <b>80,000</b>  | <b>30,000</b> | <b>0</b> | <b>45,000</b> | <b>0</b> | <b>35,000</b> | <b>0</b> | <b>0</b> | <b>23,500</b> | <b>0</b>          |
| <b>CAPITAL PROJECTS</b>                     |                |               |          |               |          |               |          |          |               |                   |
| Project Closure                             |                |               |          |               |          |               |          |          |               | 12,600,000        |
| <b>TOTAL CAPITAL PROJECTS</b>               | <b>0</b>       | <b>0</b>      | <b>0</b> | <b>0</b>      | <b>0</b> | <b>0</b>      | <b>0</b> | <b>0</b> | <b>0</b>      | <b>12,600,000</b> |
| <b>RESERVE FUND SPENDING</b>                |                |               |          |               |          |               |          |          |               |                   |
| <b>BEGINNING YEAR BALANCE</b>               | <b>500,000</b> |               |          |               |          |               |          |          |               |                   |
| Annual Outage, Routine Maint                |                |               |          |               |          |               |          |          |               |                   |
| Turner CT and Gen Maint                     |                |               |          |               |          |               |          |          |               |                   |
| ALA1 CT and Gen Maint                       |                |               |          |               |          |               |          |          |               |                   |
| ALA2 CT and Gen Maint                       |                |               |          |               |          |               |          |          |               |                   |
| <b>TOTAL RESERVE FUND SPENDING</b>          |                |               |          |               |          |               |          |          |               |                   |
| <b>ADDITIONAL FUNDING</b>                   |                |               |          |               |          |               |          |          |               |                   |
| <b>END OF YEAR BALANCE</b>                  | <b>500,000</b> |               |          |               |          |               |          |          |               |                   |
| <b>TOTAL O&amp;M, ALL PROJECTS, FUNDING</b> | <b>80,000</b>  | <b>0</b>      | <b>0</b> | <b>0</b>      | <b>0</b> | <b>0</b>      | <b>0</b> | <b>0</b> | <b>0</b>      | <b>0</b>          |

## 10 Year Net Cost to Members

|                             | FY 2018   | FY 2019   | FY 2020   | FY 2021   | FY 2022   | FY 2023   | FY 2024   | FY 2025   | FY 2026   | FY 2027    |
|-----------------------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|------------|
| O&M Projects                | 80,000    | 30,000    | 0         | 45,000    | 0         | 35,000    | 0         | 0         | 23,500    | 0          |
| Capital Projects            | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 12,600,000 |
| Maintenance Reserve Funding | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0         | 0          |
| O&M /Debt Costs             | 7,195,921 | 7,339,839 | 7,486,636 | 7,636,369 | 7,789,096 | 7,944,878 | 8,103,776 | 8,265,851 | 8,431,168 | 0          |
| A&G                         | 435,579   | 444,291   | 453,176   | 462,240   | 471,485   | 480,914   | 490,533   | 500,343   | 510,350   |            |
| Revenues (net)              | 4,043     | 4,382     | 5,732     | 7,564     | 6,970     | 6,594     | 7,706     | 13,005    | 13,856    | 11,336     |
| Net Cost to Members         | 7,707,457 | 7,809,748 | 7,934,081 | 8,136,045 | 8,253,611 | 8,454,199 | 8,586,603 | 8,753,189 | 8,951,163 | 12,588,664 |
| Capacity Cost (\$/KW-Yr)    | 154       | 156       | 159       | 163       | 165       | 169       | 172       | 175       | 179       | 252        |

