

**2016 Risk Assessment Mitigation Phase
Investigation 16-10-015
Workpapers to
Distributed Energy Resources - Safety
and Operational Concerns
(Chapter SDG&E-4-WP)**

January 2017



2016 Risk Assessment Mitigation Phase
SDGE-04-WP
Risk: Distributed Energy Resources - Safety and Operational Concerns (O&M)

| Line No. | Mitigation | Project/Program | Project/Program Description | Recorded (Directs, 2015 \$000) | | | | | | Forecast Range (Directs, 2015 \$000) | | | | | | Forecast Methodology |
|----------|---|-------------------------------|--|--------------------------------|------|------|------|------|------|--------------------------------------|-----------|----------|-----------|----------|-----------|----------------------|
| | | | | Status | 2011 | 2012 | 2013 | 2014 | 2015 | 2017 Low | 2017 High | 2018 Low | 2018 High | 2019 Low | 2019 High | |
| 1 | Power Quality Studies of DER Interconnections | Interconnection Studies | Addresses the operational issues concerning the interconnection of DERs to the distribution system | B/P | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | 3-Year Average |
| 2 | Improved Modeling Tools | Distribution Planning Process | Addresses the growing impact DERs have on the distribution system | B/P | - | - | - | - | - | 50 | 125 | 50 | 125 | 50 | 125 | Zero Based |
| 3 | Increased Outreach Program | Interconnection Outreach | Addresses the impact DERs may have on emergency response of first responders such as police, fire departments, and others | P | | | | | | 300 | 500 | 300 | 500 | 300 | 500 | Zero Based |
| 4 | Interconnection Compliance | Interconnection Compliance | Site inspection and compliance activities associated with proper signage on DER systems to ensure customer and employee safety | B/P | - | - | - | - | 1 | 758 | 960 | 758 | 960 | 758 | 960 | Zero Based |
| 5 | Anti-Islanding Testing Program | Interconnection Compliance | Perform routine test of inverter to verify proper operation of anti-islanding functionality | P | | | | | | 200 | 300 | 200 | 300 | 200 | 300 | Zero Based |
| 6 | TOTAL | | | | \$ - | \$ - | \$ - | \$ - | \$ 1 | \$ 1,308 | \$ 1,885 | \$ 1,308 | \$ 1,885 | \$ 1,308 | \$ 1,885 | |

Notes:

- Baseline (B) and Proposed (P).
- Numbers in risk chapter tables may differ due to rounding.
- The purpose of Risk Assessment Mitigation Phase (RAMP) is not to request funding. Any funding requests will be made in the General Rate Case (GRC). The forecasts for mitigations are not for funding purposes, but are rather to provide a range for the future GRC filing. This range will be refined with supporting testimony in the GRC.

2016 Risk Assessment Mitigation Phase
SDGE-04-WP
Risk: Distributed Energy Resources - Safety and Operational Concerns (Capital)

| Line No. | Mitigation | Project/Program | Project/Program Description | Status | Recorded (Directs, 2015 \$000) | | | | | Forecast Range (Directs, 2015 \$000) | | | | | | | | |
|----------|---|-------------------------------|--|--------|--------------------------------|------|--------|--------|----------|--------------------------------------|-----------|----------|-----------|----------|-----------|---------------------|----------------------|----------------------|
| | | | | | 2011 | 2012 | 2013 | 2014 | 2015 | 2017 Low | 2017 High | 2018 Low | 2018 High | 2019 Low | 2019 High | 2017-2019 Low (Sum) | 2017-2019 High (Sum) | Forecast Methodology |
| 1 | Power Quality Studies of DER Interconnections | Interconnection Studies | Addresses the operational issues concerning the interconnection of DERs to the distribution system | B/P | \$ - | \$ - | \$ 329 | \$ 242 | \$ 38 | \$ 200 | \$ 400 | \$ 200 | \$ 400 | \$ 200 | \$ 400 | \$ 600 | \$ 1,200 | 3-Year Average |
| 2 | Improved Modeling Tools | Distribution Planning Process | Addresses the growing impact DERs have on the distribution system | B/P | - | - | - | 122 | 1,643 | - | - | - | - | - | - | - | - | |
| 3 | Increased Outreach Program | Interconnection Outreach | Addresses the impact DERs may have on emergency response of first responders such as police, fire departments, and others | P | | | | | | - | - | - | - | - | - | - | - | |
| 4 | Interconnection Compliance | Interconnection Compliance | Site inspection and compliance activities associated with proper signage on DER systems to ensure customer and employee safety | B/P | - | - | - | - | - | - | - | - | - | - | - | - | - | |
| 5 | Anti-Islanding Testing Program | Interconnection Compliance | Perform routine test of inverter to verify proper operation of anti-islanding functionality | P | | | | | | - | - | - | - | - | - | - | - | |
| 6 | TOTAL | | | | \$ - | \$ - | \$ 329 | \$ 364 | \$ 1,681 | \$ 200 | \$ 400 | \$ 200 | \$ 400 | \$ 200 | \$ 400 | \$ 600 | \$ 1,200 | |

Notes:

- Baseline (B) and Proposed (P).
- Numbers in risk chapter tables may differ due to rounding.
- The purpose of Risk Assessment Mitigation Phase (RAMP) is not to request funding. Any funding requests will be made in the General Rate Case (GRC). The forecasts for mitigations are not for funding purposes, but are rather to provide a range for the future GRC filing. This range will be refined with supporting testimony in the GRC.

2016 Risk Assessment Mitigation Phase
SDGE-04-WP
Risk: Distributed Energy Resources - Safety and Operational Concerns (GRC Total - O&M)

| | | | | Recorded (Directs, 2015 \$000) | | | | | | | | Forecast Range (Directs, 2015 \$000) | | | | | | | | | |
|----------|---|-------------------------------|--|--------------------------------|----------|----------|----------|----------|----------|--------------|----------------|--------------------------------------|---------------|--------------|---------------|--------------|---------------|------------------|-------------------|--------------------|---------------------|
| Line No. | Mitigation | Project/Program | Project/Program Description | Status | GRC 2011 | GRC 2012 | GRC 2013 | GRC 2014 | GRC 2015 | Non-GRC 2015 | O&M Total 2015 | GRC 2017 Low | GRC 2017 High | GRC 2018 Low | GRC 2018 High | GRC 2019 Low | GRC 2019 High | Non-GRC 2019 Low | Non-GRC 2019 High | O&M Total 2019 Low | O&M Total 2019 High |
| 1 | Power Quality Studies of DER Interconnections | Interconnection Studies | Addresses the operational issues concerning the interconnection of DERs to the distribution system | B/P | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - | \$ - |
| 2 | Improved Modeling Tools | Distribution Planning Process | Addresses the growing impact DERs have on the distribution system | B/P | - | - | - | - | - | - | - | 50 | 125 | 50 | 125 | 50 | 125 | - | - | 50 | 125 |
| 3 | Increased Outreach Program | Interconnection Outreach | Addresses the impact DERs may have on emergency response of first responders such as police, fire departments, and others | P | | | | | | | | 300 | 500 | 300 | 500 | 300 | 500 | - | - | 300 | 500 |
| 4 | Interconnection Compliance | Interconnection Compliance | Site inspection and compliance activities associated with proper signage on DER systems to ensure customer and employee safety | B/P | - | - | - | - | 1 | - | 1 | - | - | - | - | - | - | 758 | 960 | 758 | 960 |
| 5 | Anti-Islanding Testing Program | Interconnection Compliance | Perform routine test of inverter to verify proper operation of anti-islanding functionality | P | | | | | | | | 200 | 300 | 200 | 300 | 200 | 300 | - | - | 200 | 300 |
| 6 | TOTAL | | | | \$ - | \$ - | \$ - | \$ - | \$ 1 | \$ - | \$ 1 | \$ 550 | \$ 925 | \$ 550 | \$ 925 | \$ 550 | \$ 925 | \$ 758 | \$ 960 | \$ 1,308 | \$ 1,885 |

Notes:

- Baseline (B) and Proposed (P).
- Numbers in risk chapter tables may differ due to rounding.
- The purpose of Risk Assessment Mitigation Phase (RAMP) is not to request funding. Any funding requests will be made in the General Rate Case (GRC). The forecasts for mitigations are not for funding purposes, but are rather to provide a range for the future GRC filing. This range will be refined with supporting testimony in the GRC.