DOCKETED

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Project Title:	Sacramento Municipal Utility District SMUDGEO #1
TN #:	210186
Document Title:	Sonoma (Unit 3) Response to Rotor Petition to Amend Data Request
Description:	N/A
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Please provide a general description of the rotor replacement process, what is involved with replacing the rotors? How long will the replacement process take?

The steam from the geothermal resource is routed through steam turbines connected to electrical generators to generate power. The rotating internals of the turbine resemble fan blades that rotate as the steam passes through them. Each rotor comes with set of diaphragms, which consists of stationary nozzles that direct the steam into each stage of rotating blades. The rotor and diaphragm set is engineered to achieve an efficient use of the energy contained in the steam. In the geothermal steam power generation industry, the rotor/diaphragm sets are swapped out with a spare rotor/diaphragm set at every major overhaul. The removed set is then cleaned of mineral deposits and refurbished at the Geysers machine shop and made ready for the next overhaul. Major overhauls occur on a frequency of 5 to 10 years at each plant.

The turbine rotor replacement process can be broken down into disassembly, cleaning and inspection and replacement. These steps are further described as follows:
Turbine Disassembly: All Work to disassemble the turbine, remove and inspect bearings, journals and oil deflectors. Turbine will be disassembled to the point that rotors, packing boxes, and diaphragms are removed and sent to the Geysers shop for repair.
Turbine cleaning and inspections: Clean inspect & measure all bearings, bearing journals, bearing covers, main oil pump, thrust wear detector, emergency trip device, oil deflectors, exhaust hood keys, and steam seal.
Turbine Reassembly:
Install and set:

- diaphragms axial clearances & heights.
- diaphragms and align using laser alignment including “Tops-On” laser alignment checks.
- bearings, bearing covers, main oil pump, thrust-wear detector, front standard, and oil deflectors. (Dye check bearing seats & journals)
- steam seal cases and packing rings.
- rotors and verify clearances using industry standard procedures.

Perform thrust bearing bump check and adjust as needed.
Take all measurements for alignment keys & install.
Perform coupling alignments and bolt stretch.

The complete process is expected to take approximately two months.

Are truck deliveries anticipated for the replacement rotors, if so, how many and for what duration?

The LP rotors and diaphragms are expected to arrive in 7 to 8 truckloads and will arrive over the duration of one month. Four of the truck loads will require road permits.

Will there be a need for construction workers to install? If so, how many? Or will this be done by plant personnel?

The work will be done by a contractor. There will be a day and night shift with normally 20 workers on each shift. The anticipated peak staffing level is expected to be 30 per shift.

Is any ground disturbance required for the installation?

No, there will not be any ground disturbance.

Please identify any additional permits or agency notifications required for the rotor replacements.

The project was reviewed with the Northern Sonoma County Air Pollution Control District. The District has concluded that the project will not need an air permit because rotor replacement is routine maintenance in the Geysers.

Please provide photo-documentation of the unit where the rotor replacements will occur and a site map identifying the area where the unit is located and any laydown or storage areas if applicable.

Below are the two Sonoma (Unit 3) turbines in the foreground with the generator in the background. Replacement work will occur on this turbine deck. A spare rotor can be seen in the upper left and parts will be similarly staged for the LP rotor replacement.