**Robert A. Johnston Comments**

**On the Draft 2023-2025 Wildfire Mitigation Plan Guidelines—Package 1**

A. Standardization of Analyses.

Several elements of WMPs should be defined in more detail by OEIS. Some parts of the WMP process should be taken over by State agencies in order to make utility WMPs comparable.

1. Risk Scenarios should be defined by a State agency and the agency should require uniform methods to be used by all utilities.

2. All Modeling should be performed by a State agency. Fire Hazard tiers should be uniform for all utilities. Fire Behavior Modeling should be done by a State agency for the utilities. Weather modeling should likewise be done by the State. Ignition Likelihood and Ignition Consequences should also be modeled by a State agency.

3. Risk Assessment Methods should be further standardized. All Mitigation Initiatives should be defined in detail, so that utility risk assessments can be strictly compared in one year and across years.

4. QA/QC Methods should also be standardized for all utilities.

B. Environmental Impacts.

CEQA and many other State statutes require all agencies and citizens to protect the natural environment. Evaluating the impacts of WMP Initiatives on forest health and on fire hazards on-site is critical to avoid unintended adverse impacts. This is especially important for the Vegetation Management (VM) Programs of the utilities.

1. Please require an analysis of environmental impacts of all Initiatives in utility WMPs. For Vegetation Management Programs this provision could be added in sec. 8.2.1.3 (Performance Metrics for the VM Program) in the Guidelines.

2. More generally, at sec. 8.2.5 (Environmental Compliance) please add a requirement for utilities or Lead Agencies to perform a CEQA assessment of WMPs at the utility level as soon as is practicable. Also, see 8.5.5. The statewide programmatic EIR being done by the State Water Board is so broad that it will not be able to evaluate specific alternative WMP Initiatives, in specific locations, such as improved line monitoring devices versus enhanced vegetation management. It is a 401 Waste Discharge Regulation Order on all utility O&M activities of all utilities. A tiered EIR could possibly do this in a second phase, but will be about 2 years away.

C. Equipment Hardening.

Of all the Initiatives in the three big IOU WMPs, hardening of equipment stands out as being capable of widespread use and being very cost-effective (RSE). However, this mitigation method is treated very differently by PG&E, when compared to SCE and SDG&E. More oversight is needed.

1. Rapid fault detection. The latter two utilities have made strong commitments to adding remote line sensors to their systems (early fault detection, open phase detection, high-impedance detectors, etc.). These devices have been proven to reduce wildfire ignitions from shorting and arcing equipment. For example, they shut off a circuit before the line can hit the ground, in the case of a line failure (2 seconds). PG&E committed in their 2021 WMP to install these computerized circuit breakers “more so than ever done by any utility”. Then, they swerved off in the direction of undergrounding power lines, a very expensive mitigation technique. In their 2022 WMP, they committed to only 42 more line sensors (OEIS Draft Decision on 2022 PG&E WMP Update, pg. 10). Advanced line sensors should be assumed to be cost-effective by OEIS.

2. Covered conductors. This is another relatively inexpensive Initiative that is effective in reducing ignitions. SCE and SDG&E have focused investments on retrofit insulation of their distribution lines in Tier 2 and 3 areas. In their 2022 WMPs, these two utilities have continued their emphasis on insulating power lines, while PG&E has reduced their line-mile targets for insulating power lines. Figure 8-2 (p. 113) in this Draft Guidelines shows that from 2015 through 2021, PG&E ignitions are UP, SCE’s are FLAT, and SDG&E’s are DOWN. Also, the OEIS Draft Decision on PG&E’s 2022 WMP Update says on pg. 110 that “data... from PG&E does not show any trend (decrease or increase) in the number of vegetation-caused outages or ignitions on PG&E’s grid”. So far, the PG&E strategy (vegetation management, undergrounding) has not paid off. Overall, PG&E has reduced their targets for system hardening (OEIS Draft, pg. 83), while the line-miles have been trivial anyway (103 miles or less every year). Covered conductors should be assumed to be cost-effective by OEIS.

Why did PG&E change their mind about rapid fault sensors and retrofit insulation? Shortly after their new President Patti Poppe took over, she announced a new initiative to underground 10,000 miles of power lines (7/21/21). I may have influenced that decision, as my Op Ed in the SF Chronicle advocating that PG&E underground all of their lines to reduce post-wildfire costs was published on 1/4/19. Since then, experience has shown that undergrounding costs about 7 times per line-mile what insulation costs and insulation is nearly as effective in reducing ignitions. In the OEIS Draft Decision on PG&E’s 2022 WMP Update (10/22) it was found that PG&E has never shown that undergrounding is cost-effective (RSE). So, the good news is that PG&E could switch the undergrounding funds and use them to insulate lines and add rapid circuit breakers on all 33,000 mile of lines in Tier 2 and 3 areas.

As a result of the conclusive data on the effectiveness of rapid fault detection devices and of insulated conductors and the lack of such data for undergrounding of lines and given the huge cost for undergrounding, it is time that OEIS require PG&E to invest in rapid fault sensors and in insulating their power lines. Perhaps declare these to be more cost-effective than undergrounding as a rebuttable presumption that PG&E can overcome, with the burden of proof on them. I think it’s time that we simply consider insulated lines and rapid sensors as basic equipment in modern electric systems.

C. Vegetation Management.

Likewise, vegetation programs have proven to be only moderately effective in reducing ignitions (see the OEIS Draft Decision on PG&E’s WMP 2022 Update, at p. 113). In addition, vegetation trimming and removal is difficult to evaluate, due to confounding variables in the local environment. I am my Inverness area neighborhood tree committee chair and can give an example. Mature but only early middle-aged Doug firs get red conks (small bracket fungi, all over the tree and about 10 ft. apart). However, about a third of mature Doug firs have these fungi on them and they are standing after decades of infection. That means that it generally takes several decades for trees to be weakened enough to fall over. Only expensive imaging or drilling tests all up and down a tree can determine how much rot there is inside it. So, arborists exercise judgement by looking at the canopy health, the bark, the root line, and other signs. The decision is highly uncertain. In the half-mile of road in my neighborhood, we have never in 50 years had a fir fall on the power line which runs up the road. Just last week, however, a bay laurel that had been inspected five or more times by the PG&E tree patrol people in the last three years and not marked for removal, fell onto the power line creating a fault situation on our road on a hot afternoon in the max wildfire season. These two cases show that vegetation management is inherently uncertain. Under their Enhanced Veg Mgmt Program, PG&E intends to remove all sick or old or leaning trees within 100 ft. of distribution lines in Tier 2 and 3 areas, along 33,000 miles of lines. Millions of trees worth about $10,000 each in small claims court, if near to a home or visible from it. This initiative is very uncertain and very expensive. The economic costs are real, even if owners don’t sue in small claims court.

Vegetation management also damages forests. Removing trees increases the sunlight on the understory which increases the growth of those plants, which increases the fire hazard in the area, especially in low-wind fire spread situations. Also, removing trees increases the chances of wind throw in storms, where newly exposed trees are blown over (possibly onto the power lines). Furthermore, utilities leave the wood chips on the ground after chipping the small slash left over after felling trees. Chips are flammable and CalFire recommends that you do not leave them on the ground. Please require the utilities to evaluate all of the environmental impacts of their vegetation programs.

Property owners all over California have reported erosion caused by utility contractors dragging tree trunks away, damage to nearby trees from forestry equipment, and other problems caused by tree removals. These adverse impacts should be included in the WMPs.

Last, I note that vegetation removal is temporary, lasting about 5-10 years before you have to thin and clear trees again. Insulating lines and adding rapid line sensors solves most of the ignition problem forever, with normal equipment replacements.

Lastly, vegetation programs seem to be subject to inaccurate and inefficient implementation. In our little neighborhood, we have seen the PG&E contractors cut down the wrong trees, miss cutting down the marked trees in about half of the cases, and exhibit basic problems such as illiterate workers not being able to read the PG&E work orders. It is a terrible mess. The Sierra Club Utility Wildfire Prevention task force has collected horror stories from property owners that have been devastated by wholesale removal of trees nowhere near to the power lines, etc. Vegetation programs are inaccurately focused and have high political costs that could result in difficulties for all WMP initiatives in the future.

Please require utilities to limit vegetation management programs to be used only in conjunction with insulating lines and adding rapid fault sensors and related equipment. Please require that their Risk Analyses take into account the changed risks from having insulated lines and rapid fault detectors. In other words, treat insulating power lines and computerized circuit breakers as basic equipment upgrades needed under all circumstances.

Thank you. Bob Johnston

415 663-8305 rajohnston@ucdavis.edu

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My Qualifications:

I was a professor of Environmental Planning at UC Davis, 1971-2005. I was an pioneer developer of GIS software in the early 70s and have done applied geo-models and data tools for many California counties and several State and federal agencies. I have been a planning commissioner in two California cities and on many local, State, and federal advisory boards. I now am on the board of the Sierra Nevada Conservancy and so have learned the basics of fire science and forest ecology. I have been an expert in CEQA and NEPA lawsuits all over the U.S. I am the chair of my neighborhood’s tree committee and work with the Sierra Club Utility Wildfire Prevention task force.