UNC CHARLOTTE
The WILLIAM STATES LEE COLLEGE *of* ENGINEERING

Senior Design Project Description for FALL 2016

Project Title: A Better Approach to Vegetation Management at Utility-Scale PV Plants (EPRI_MAINT)

Supporter: EPRI

Supporter Technical Representative: ASSIGNED

Faculty Mentor: __X__ ASSIGNED _____ TBD (check one)

Single Team __X__ Dual Team _____ (check one)

Personnel (EN/ET): _____ E, __1__ Cp, _____ Cv, __2__ M, __3__ SE

(Complete if the number of students required is known)

Expected person-hours: (250 per student)

Description of Project:

One of the larger costs associated with operations and maintenance (O&M) of utility-scale PV plants is vegetation management. In temperate climates, some weeds can grow 10+ inches per week. If not maintained on a regular basis, the weeds can shade PV modules, which reduces energy production and can cause hot spots in the module (a potential fire hazard). There is, oftentimes, insufficient O&M budget for proper vegetation control. Plant maintenance providers have tried a litany of conventional and unconventional approaches with inconsistent success over the relatively large footprint of PV plants (a 100 MW plant requires nearly 1 square mile). For instance, regular mowing often shoots rocks into modules breaking them (exacerbating the O&M budget further) and sheep and goats are picky plant eaters.

This senior design project aims to develop a vegetation control tool or technique that overcomes shortcomings of existing methods.

Initial Project Requirements (e.g. weight, size, etc.):

This senior design project aims to develop a vegetation control tool or technique that overcomes shortcomings of existing methods. The approach must:

- be more cost effective than current techniques;
- mow all areas of a PV plant, including under the modules and racking;
- be quickly and easily sited at a plant (cannot permanently integrate into the plant itself);
- not damage the PV site and equipment;
- be reliable, autonomous, and dispatchable; and
- not modify the environment / native habitat (e.g., cannot introduce foreign plants or scorch the earth).

One example solution could be a completely autonomous, industrial-strength “Roomba” for weeds. ‘

UNC CHARLOTTE
The WILLIAM STATES LEE COLLEGE *of* ENGINEERING

Expected Deliverables/Results:

The end goal of the project is, at a minimum, a working prototype demonstrated in a relevant environment (not necessarily at a PV plant).

List here any specific skills or knowledge needed or suggested (If none please state none):

None