Stanford | Environmental Health & Safety

ESMPR Appendix 1 Risk Assessment

NO answers = Research Routine Hazard Category

YES answers within thresholds = Research High Hazard Category: Complete SOP(s) (Appendix 2) and Qualified Person Designation (Appendix 3)

YES answers above thresholds = Research Prohibited

Risk Identification Questions	Risk Magnitude Assessment	High Hazard Work Registration Guideline Thresholds
Do researchers have the potential to contact a conductor energized at 50 volts or greater? **OR, to test exposed conductors for the presence of electricity of 50 volts or greater?** **OR, to do work at less than 50 volts but at levels 1000 amps and greater in a circuit?**	List: ● Maximum voltage ● Maximum amperage ● AC/DC ● Hertz <u>Upper Thresholds: Research Prohibited</u> ❑ AC: more than 250 volts ❑ All 3-phase work ❑ Others may be use-specific	❑ AC: 50 to 250 volts, single phase ❑ DC and other sources: use-specific ❑ All circuits carrying 1000 amps or greater regardless of voltage or whether AC or DC
Does the researchers use and/or store capacitors greater than 5 joules?	● How many capacitors? ● Largest capacitor? ● Are capacitors arranged in banks? ● Total capacitance? <u>Risk Mitigation Best Practices</u> ❑ Automated capacitor grounding systems ❑ Hand-held grounding wands to ensure zero charge in capacitor circuits ❑ Faraday cages, interlocks and other guarding devices near large capacitors / capacitor banks	❑ Capacitors 5 joules or greater in size that are exposed, allowing potential physical contact as part of research work ❑ Stored capacitors of 5 joules or larger that do not have bonding and grounding straps installed on them ❑ =>100 V and => 10 J

Do researchers build or modify equipment powered by 50 volts or greater?	• What activities are done? • Is equipment listed by NRTL? o If not, are proprietary equipment components listed by NRTL? • What kinds of equipment are modified? • To what extent is the equipment modified? • Does the manufacturer approve of the equipment modifications? • What is the purpose of the modifications? • Who does this work and where? • Do the modifications void warrantees or cause the equipment to operate in a way not intended by the manufacturer? • Is equipment returned to a non-modified state, or destroyed, once research is complete? <u>Risk Mitigation Best Practices</u> ❑ Use of NRTL or other standardized components ❑ Systems safety review ❑ Specialized equipment inspections	❑ Permanent removal of manufacturer-supplied equipment guard(s) that exposes conductors or other physical hazards ❑ Modifications that remove or negate an NRTL rating ❑ Modifications that void equipment manufacturer's warrantees ❑ Proprietary equipment built from non-NRTL approved components ❑ Equipment built outside of code compliance with NFPA70, the CEC, and/or IEEE electrical equipment standards ❑ Modified equipment that is re-purposed for another use after original research is complete
Do researchers build or modify electrical storage devices or batteries?	• What activities are done? • What is the storage capacity?	❑ 50 to 100 V