

# All Agency Project Request

2013 - 2015 Biennium

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<b><u>Agency</u></b>	<b><u>Institution</u></b>	<b><u>Building No.</u></b>	<b><u>Building Name</u></b>
University of Wisconsin	Madison	285-0A-9950	Multi-Building

<b><u>Project No.</u></b>	14A2M	<b><u>Project Title</u></b>	UWMSN Arc Flash Hazard Analysis
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## **Project Intent**

This project surveys, provides analysis, and installs arc flash labeling for building electrical equipment in UW-Madison facilities. OSHA regulations require all persons working on energized electrical equipment to read equipment labels and follow the safety guidelines included in NFPA 70E.

## **Project Description**

Project work includes providing engineering services required for an electrical arc flash hazard analysis of approximately 13.5 million gross square feet of space in approximately 210 buildings on the UW-Madison campus and approximately 305 buildings located off the main campus. Off campus facility locations include the Arboretum, Pine Bluff Observatory, Kegonsa Research Center, Trout Lake Research Station, Charmany Farm, Mandt Farm, Lancaster Agricultural Research Station (ARS), Arlington ARS, Hancock ARS, Spooner ARS, Marshfield ARS, Peninsular ARS, Rhinelander ARS, West Madison ARS, and Kemp ARS. Conduct Arc Flash Analysis of ten campus sewage lift stations. Provide specialized consultant resources to complete arc flash analysis in ten campus 5kV and 15kV electrical substations comprised of 148 circuit breaker/relay units. This will include load flow analysis of the campus medium voltage distribution systems. Issue a report for each building/station using DFD arc flash guidelines and specifications. An analysis for each building shall include the following:

- Survey the electrical distribution system
- Prepare one-line diagram, short circuit, and coordination study
- Calculate arc fault hazard
- Determine safe working distance or arc-flash boundary from the equipment
- Determine appropriate (PPE) personal protective equipment/clothing to avoid injury from an arc flash
- Produce and install code-required labels on building electrical equipment.
- Determine potential arc flash problems (incident energy greater than 40 calories per centimeter squared) and recommend solutions including scope and budget

## **Project Justification**

NFPA 70E requires facility owners to perform an arc flash hazard analysis prior to allowing a worker to perform a task on energized equipment. The National Electrical Code (NEC) mandates that a warning label must be placed on electrical equipment that may remain energized during maintenance or repair. Equipment that needs to be labeled includes switchboards, panel boards, control panels, and motor control centers. In order to print the label for each piece of equipment, an analysis is needed to determine the thermal energy hazard possible from an arc flash. OSHA requires that employers protect employees from workplace hazards. If OSHA is called in following an incident, they will determine if compliance with NFPA 70E would have prevented or lessened the injury and they may cite the employer for not using NFPA 70E to protect their employees.

The effects of an electrical arcing fault can be devastating. The intense thermal energy can cause severe burns in a fraction of a second to faculty, staff, and students who are exposed to live electrical equipment. Other considerations include loss of life, potential litigation fees, loss of process and research, potential fines, and escalation of insurance premiums. A hazardous arc flash can occur in any electrical device, regardless of voltage, in which the energy is high enough to sustain an arc.

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**A/E Consultant Requirements**

A/E Selection Required?

Consultants should have specific expertise and experience in electrical system surveys, preparation of one line diagrams, short circuit and coordination studies, calculation of arcing fault hazard and production of arc fault hazard reports for buildings and electrical substations. Consultants should indicate specific projects from past experience (including size, and completion date) in their letter of interest and when known, include proposed consulting partners and specialty consultants.

**Commissioning**

- Level 1
- Level 2

**Project Budget**

Construction Cost:		\$-	
Haz Mats:		\$-	
Construction Total:		\$-	
Contingency:	15%	\$-	
A/E Design Fees:	8%	\$-	
DFD Mgmt Fees:	4%	\$-	
Equipment/Other:		\$-	

**Funding Source**

GFSB - <input type="checkbox"/>		\$-	
PRSB - <input type="checkbox"/>		\$-	
Agency/Institution Cash [AGF0]		\$-	
Gifts		\$-	
Grants		\$-	
Building Trust Funds [BTF]		\$-	
Other Funding Source		\$-	

**Total**

**Project Schedule**

- SBC Approval: 03/2014
- A/E Selection: 03/2014
- Bid Opening:
- Construction Start: 06/2014
- Substantial Completion: 09/2015
- Project Close Out: 12/2015

**Project Contact**

- Contact Name: Kurt Johnson
- Email: <kjohnson@fpm.wisc.edu>
- Telephone No.: (608) 262-7776 x

**Project Scope Consideration Checklist**

**Y N**

1. Will the building or area impacted by the project be occupied during construction? If yes, explain how the occupants will be accommodated during construction.    

All project work will be coordinated through campus physical plant staff to minimize disruptions to daily operations and activities.
2. Is the project an extension of another authorized project? If so, provide the project #...
3. Are hazardous materials involved? If yes, what materials are involved and how will they be handled?

Required hazardous materials abatement has been included in the estimated project schedule and project budget. Comprehensive building survey inventory data is not available for all buildings on Wisconsin's Asbestos & Lead Management System (WALMS) <<http://walms.doa.state.wi.us/>>.

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4. Will the project impact the utility systems in the building and cause disruptions? If yes, to what extent?    
*All project work will be coordinated through campus physical plant staff to minimize disruptions to daily operations and activities.*
5. Will the project impact the heating plant, primary electrical system, or utility capacities supplying the building? If yes, to what extent?
6. Are other projects or work occurring within this project's work area? If yes, provide the project # and/or description of the other work in the project scope.
7. Have you identified the WEPA designation of the project...Type I, Type II, or Type III?    
*Type III.*
8. Is the facility listed on a historic register (federal or state), or is the facility listed by the Wisconsin Historical Society as a building of potential historic significance? If yes, describe here.
9. Are there any other issues affecting the cost or status of this project?
10. Will the construction work be limited to a particular season or window of opportunity? If yes, explain the limitations and provide proposed solution.
11. Will the project improve, decrease, or increase the function and costs of facilities operational and maintenance budget and the work load? If yes, to what extent?
12. Are there known code or health and safety concerns? If yes, identify and indicate if the correction or compliance measure was included in the budget estimate, or indicate plans for correcting the issue(s).
13. Are there potential energy or water usages reduction grants, rebates, or incentives for which the project may qualify (i.e. Focus on Energy <<http://www.focusonenergy.com>> or the local utility provider)? If yes, describe here.
14. If this is an energy project, indicate and describe the simple payback on state funding sources in years and the expected energy reduction here.