



Department of Environmental Health and Safety

Subject: Field Fabricated Experimental Equipment

Date: September 2014

Revision: 4

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SUMMARY:

Experimental equipment designed and/or assembled by researchers or “field fabricated” have potential to cause loss of life and major facility damage. Such equipment can produce unfortunate incidents on campus, and the cause is typically unsafe electrical and mechanical system design or assembly. Electrical and mechanical system installation and use is strictly regulated through building codes, electrical code and safety standards.

This guideline provides mechanisms for the reduction or elimination of hazards commonly associated with non-commercial, field fabricated research equipment. Primary responsibility falls upon the Principal Investigator (PI) and the individual academic unit which must implement policies and educate their constituents on equipment safety requirements.

SCOPE:

This Guideline applies to all University of Michigan Dearborn (UM-Dearborn) personnel conducting scientific research with field fabricated equipment.

REFERENCE DOCUMENTS:

These documents provide guidance, rules, and regulations that govern the creation and/or use of electrically energized equipment and building utilities.

- State of Michigan Mechanical Code 2006 and Plumbing Code 2006.
- NFPA 45 2004-Fire Protection for Laboratories
- NFPA 70 -National Electrical Code, 2005 with UM modifications
- NFPA 72 -National Fire Alarm Code, 2002 with UM modifications
- UM Design Guidelines Special Instructions to Designers, 2008 SID-F: Codes and Regulatory Agencies
http://www.aec.bf.umich.edu/desguide/sid/sid_f.pdf
- Various MIOSHA Safety Standards related to the specific equipment or Application http://www.michigan.gov/dleg/0,1607,7-154-11407_15368_23451---,00.html
- [MIOSHA Part 85 Control of Hazardous Energy Sources](#)

RESPONSIBILITY: Deans, Directors, and Department Heads

- Ensure that adequate facilities, ventilation, and equipment are provided.
- Coordinate the implementation of recommended remedial action measures when necessary to correct health or safety deficiencies.
- Ensure an environment where Principal Investigators (PI) and other personnel are required to follow this Guideline.
- Actively promote this Guideline within individual units under their authority by ensuring individuals working within areas under their control have the appropriate resources to implement the procedures.



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Principal Investigators/ Supervisors

- Implement procedures in accordance with this Guideline.
- Ensure field fabricated equipment is compliant with applicable codes.
- Ensure hazards and risks are identified and controlled.
- Ensure that staff is instructed on the use of all field fabricated equipment.
- Assign resources to support the implementation of this Guideline.
- Report all work related injuries and illnesses within 24 hours by completing an Illness and Injury Report Form (<http://www.umd.umich.edu/694753/>)

EHS

- Provide technical assistance and conduct equipment safety audits.
- Evaluate work conditions and practices initially, upon request, and after an incident.

Employees

- Comply with this guideline and safety procedures initiated by the PI or supervisor.
- Conduct tasks in a safe manner, wear appropriate personal protective equipment, and only use equipment for which they have been trained.
- Report to the PI any job related injuries or illnesses, health and safety concerns, and unsafe or unhealthy working conditions.

PROCEDURES:

The following procedures have been prepared to provide a consistent approach to the safe use of field fabricated equipment at UM-Dearborn

Advanced Planning

1. Contact the Facility Operations Call Center (593-5270) during the planning stages of new or modified field fabricated equipment. EHS will assist in the identification of potential risk factors or hazards and facilitate control measures.
2. Contact Facilities Operations Call Center (593-5270) if the project may impact building systems including: heating, ventilation, air conditioning, electrical, plumbing, or structural. Facilities Management must approve all such system changes or modifications.



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3. Only Underwriters Laboratories (UL) and Factory Mutual (FM) listed equipment is permitted. Electrical equipment or devices not UL or FM listed must be reviewed and approved by UM electrical inspectors.
4. Comply with all required modifications and recommendations.

Review of equipment already in use

1. Contact Facility Operations Call Center (593-5270) to evaluate field fabricated equipment for potential hazards and facilitate implementation of controls or to evaluate any connections or potential impacts to building systems.
2. Comply with all EHS and Facilities Management recommendations before continuing operations with this equipment.

Requirements for operation of equipment

1. Write standard operating procedures (SOPs) that detail safe operation.
2. Document training provided to employees working with the equipment.

TECHNICAL SUPPORT:

Facility Operations Call Center (593-5270) provides technical support and is able to call upon plant engineers, architects, and code inspectors to assist in the evaluation and control of hazards associated with field fabricated equipment. EHS may also call upon the University's loss prevention insurance company, FM Global, to provide expert analysis.