

Mississippi Institutions of Higher Learning Best Practices for Residence Hall Fire Safety

Preface

Dormitory fire safety is a high priority on university campuses. In an effort to prevent dormitory and residence hall fires, the IHL Office of Risk Management is providing this fire-safety best practices guide. Many of the recommendation listed below are already incorporated in the fire safety policies and procedures currently being used on state university campuses.

This best-practices guide is divided into four sections with a check-list in each section to utilize in assessing current policies, procedures and rules to identify areas in which improvement can be made.

The sections are:

- Fire Prevention
- Fire Detection
- Fire Protection/Suppression, and
- Evacuation

Many of the best practices detailed in this guide are based on the combined wisdom of fire safety officers on numerous campuses. However, some of these best practices (particularly in the areas of electrical closets, fire extinguishers, and emergency exits) are mandated by International Fire Code (IFC), the fire safety standards adopted by the Mississippi Fire Marshal's Office. The best practices that are required by International Fire Code are printed in red. Those which are not code requirements are in blue. All of the best practices which have an IFC reference number attached are verbatim from the 2003 International Fire Code manual.

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FIRE PREVENTION

Fire prevention is the first and most important component of an organized residence hall fire safety program. Fire detection, suppression and evacuation all become unnecessary if a fire can be prevented by the use of sound fire safety practices and good judgment. Fire prevention measures associated with most common causes of residence hall fires (cooking, smoking, candles and incense, electrical outlets and appliances, and drinking) are detailed below.

Cooking

According to the National Fire Protection Association (NFPA), cooking is the second leading cause of fire in college dormitories and residence halls (after arson) and the leading cause of fire injuries. Limited cooking is allowed in many IHL residence halls. Some residence halls also have centrally located kitchens which are available for student use. Most of these kitchens have conventional stoves and refrigerators. In many of these kitchens students can also use deep-fat fryers, waffle irons, electric skillets and other appliances not permitted in their rooms. Following are best practices recommended with regard to cooking in residence halls:

Residence Hall Rooms:

	Microwave ovens and electric coffee makers should be UL-approved.
	Microwave ovens and coffee makers should be closely supervised while in use.
	Microwave ovens in residence halls should not exceed 1000 watts.
	Metal objects (aluminum foil, twist ties, utensils, etc.) and brown paper bags should not be placed in microwave ovens. Both have been implicated in fires involving microwave ovens.
	Electric coffee makers should only be used for one purpose; making coffee. Never use a coffee maker to cook or warm anything other than the pot that was supplied with the unit.
	Hotplates, toaster ovens, convection ovens, "George Forman" or other similar grills, crock pots, open flame appliances, oil popcorn poppers, deep fat fryers, electric skillets, or any kind of homemade electrical appliance should be prohibited in dormitory and residence hall rooms.

Centrally Located Kitchens:

	All cooking appliances should be supervised while in use.
	Cooking appliances should be Underwriters Laboratories (UL) approved and have an automatic shut-off feature.
	Never plug more than one high-wattage appliance (electric skillets, waffle irons, microwave ovens, etc.) into a single outlet.
	Keep a UL-listed fire extinguisher in the kitchen and know how to use it. It

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	should be easily located, readily accessible, and must be appropriate for grease and electrical fires (K). The Mississippi State Fire Marshall's Office has concluded that kitchens in university residence halls must be protected with Class (K) portable fire extinguishers.
	Kitchen fire safety rules should be posted in the kitchen.

Smoking

Smoking is Prohibited in All Dormitories and Residence Halls on IHL Campuses.

Although smoking is prohibited in all buildings on all IHL campuses, it still occurs with alarming regularity and is still identified as a significant cause of fires in university residence halls.

	Smoking in residence halls should be closely monitored by residence hall directors and their staff. Besides the obvious signs such as full ashtrays and the smell of cigarette smoke, students who smoke in their rooms frequently cover their smoke detectors with plastic.
	If smoking is not prohibited campus-wide, a designated smoking area adjacent to the building would provide students an alternative to smoking in their rooms.
	Violations and subsequent consequences should be clearly defined and communication to residents.

Candles/Incense

The Burning of Candles and Incense (all open flames) are Prohibited in All IHL Residence Halls.

	Emphasize to students that candles incense or any other open flames are prohibited in their rooms.
	If candles or incense are found in residence hall rooms during room inspections, fire drills, etc. they should be confiscated.
	Violations and subsequent consequences should be clearly defined and communication to residents.

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Electrical Outlets and Appliances

Overloaded electrical outlets, damaged extension cords, and electrical appliances with heating elements have all been implicated in residence hall fires. Ideally, eliminating these potential sources of fire would be the preferred course of action. However, on some campuses this may be impractical for various reasons. Following are best practices with regard to electrical outlets and appliances.

	Do not overload electrical outlets.
	Use only one appliance per outlet.
	If an electrical outlet becomes hot to the touch, disconnect any cords or appliances and notify the RA, Residential Director, or a member of the maintenance staff.
	Use power strips with over-current protection. (A power strip with over-current protection shuts off power automatically if there is too much current being drawn.)
	“Cheater plugs”, adapters used to connect three prong electrical plugs to two prong outlets, should be prohibited.
	Electrical space heaters, window air conditioning units, and halogen lamps should be prohibited in residence hall rooms.
	Extension cords must be UL approved. They must never be routed under rugs or carpets and multiple cords should not be connected together. (IFC 605.5)
	Open junction boxes and open-wiring splices shall be prohibited. Approved covers shall be provided for all switch and electrical outlet boxes. (IFC 605.6)

Drinking Alcohol and the Elevated Risk of Fire

According to a U.S. Department of Health and Human Services study, “Alcohol and Health,” an estimated fifty percent of adults who die in house fires have high blood alcohol levels. Drinking increases the chance of falling asleep while smoking in bed. It also significantly reduces an individual’s ability to detect a fire, respond to a fire or fire alarm, and safely escape a fire. Steps should be taken to minimize alcohol consumption on university campuses, particularly in residence halls.

Although a comprehensive and enforceable campus alcohol policy may appear out-of-place in a fire safety best practices guide however, reduced alcohol consumption in residence halls could reduce the number and severity of dormitory and residence hall fires and the injuries and loss of life that accompany them. Campuses should periodically revisit their alcoholic beverage policies and

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update them to address the issues and environment that students currently face. Following are some basic recommendations to prevent alcohol related fires:

	University alcohol policy should be included in housing agreement.
	University sponsored programs directed toward curbing alcohol consumption should include all campus residents.
	Residence Hall Directors and staff, including Resident Assistants, should have a clear procedure and instructions for reporting and dealing with problems related to alcohol consumption.
	Violations and subsequent consequences should be clearly defined and communication to residents.

Electrical Rooms and Closets

International Fire Codes, the fire safety standard adopted by the state of Mississippi, stipulate that electrical closets and control room be free of combustible materials. Other requirements are listed below.

	Doors into electrical control panel rooms shall be marked with a plainly visible and legible sign stating ELECTRICAL ROOM or similar approved wording. The disconnecting means for each service, feeder or branch circuit originating on a switchboard or panelboard shall be legibly and durably marked to indicate its purpose unless such purpose is clearly evident. (IFC 605.3.1)
	Illumination shall be provided for service equipment areas, motor control centers and electrical panelboards. (IFC 605.2)
	A working space of not less than 30 inches in width, 36 inches in depth and 78 inches in height shall be provided in front of electrical service equipment. Where the electrical service equipment is wider than 30 inches, the working space shall not be less than the width of the equipment. No storage of any material shall be located within the designated working space. (IFC 605.3)
	Openings through fire-resistance rated assemblies shall be protected by self-closing or automatic-closing doors of approved construction meeting the fire protection requirements for the assembly. (IFC 703.1)

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FIRE DETECTION

Smoke / Fire Detectors / Manual Fire Alarms

Early detection and adequate alarms followed by prompt and appropriate action can minimize the loss of life and property if a fire occurs. This involves having the proper systems in the right places, maintaining them, and training residents on how to respond.

	<p>Single or multiple-station smoke alarms shall be installed and maintained in dormitories and residence halls in each room used for sleeping purposes. (IFC 907.2.10.1.2)</p>
	<p>Smoke detectors shall be connected to an automatic fire alarm system. The activation of any detector required by this section shall operate the emergency voice/alarm communication system. Smoke detectors shall be located as follows:</p> <ul style="list-style-type: none">• In each mechanical equipment, electrical, transformer, telephone equipment, or similar room which is not provided with sprinkler protection, elevator machine rooms, and in elevator lobbies.• At each connection to a vertical duct or riser servicing two or more stories from a return air duct or plenum of an air conditioning system. In Group R-2 (dormitories and residence halls) a listed smoke detector is allowed to be used in each return-air riser carrying not more than 5,000 cubic feet per minute and serving not more than 10 air-inlet openings. (IFC 907.2.12.1)
	<p>Where more than one smoke alarm is required to be installed within an individual dwelling unit or sleeping unit in Group R-2 the smoke alarm shall be interconnected in such a manner that the activation of one alarm will activate all of the alarms in the individual unit. The alarm shall be clearly audible in all bedrooms over background noise levels with all intervening doors closed. (IFC 907.2.10.3)</p>
	<p>Smoke detectors and manual fire alarms in dormitories and residence halls should be supervised by an approved central, proprietary, or remote station service or a local alarm which will sound an audible signal at a constantly attended location (campus police or security, local fire department, or an approved private sector monitoring service).</p>
	<p>Tampering with smoke/fire detectors is prohibited. Anyone caught tampering with smoke/fire detector should be expelled from student housing and subject to criminal prosecution.</p>

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Notification / 911

Improper use of 911 notification delays emergency response.

	Procedures for reporting a fire or other emergency should be posted in a conspicuous location in the office of the resident director and the front desk of each residence hall. Procedures for reporting a fire or other emergency should be posted in each residence hall room.
	Students and housing staff should be trained to properly notify the fire department using the 911 system.

FIRE PROTECTION / SUPPRESSION

Fire Extinguishers

Portable fire extinguishers are recognized as a first line of defense in the event of a fire. Recommendations and requirements for fire extinguishers are shown below.

	Portable fire extinguishers shall be installed in dormitories and residence halls such that the maximum travel distance from any location on a floor to a fire extinguisher located on that same floor is not more than 75 linear feet. (IFC 906.3.1)
	Portable fire extinguishers installed in dormitories and residence halls, outside of any designated cooking areas, should have a rating of not less than 4A, 80B, C.
	Portable fire extinguishers installed in dormitory and residence hall cooking areas should be a (K) type extinguisher having a rating of not less than 80B, C.
	Portable fire extinguishers having a gross weight not exceeding 40 pounds shall be installed so that its top is not more than 5 feet above the floor. (IFC 906.9)
	Extinguishers shall be located in conspicuous locations where they will be readily accessible and immediately available for use. (IFC 906.5)
	Fire extinguishers shall not be obstructed or obscured from view. In rooms or areas in which visual obstructions cannot be completely avoided, means shall be provided to indicate the location of extinguishers. (IFC 906.6)
	Fire extinguishers shall be inspected and serviced not less than once each year.
	Tampering with fire extinguishers is prohibited. Anyone caught tampering with a fire extinguisher should be expelled from student housing and

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	subject to criminal prosecution.
	All dormitory and residence hall staff should be trained to use portable fire extinguishers.

Automatic Sprinklers

	Every new building over seventy-five (75) feet in height in the state of Mississippi for which a permit is issued after the passage of Sections 45-11-101 through 45-11-111 (effective July 1, 1978) shall be equipped throughout the building with a totally automatic sprinkler system designed for life safety and fire prevention and protection. This provision shall include every building over seventy-five (75) feet in height constructed after the effective date of Sections 45-11-101 through 45-11-111 or to any existing building in which twenty-five percent (25%) or more of the floor space is being reconstructed or added thereto. (Mississippi Code Annotated § 45-11-103)
	Sprinkler systems shall be tested and maintained in accordance with Section 901. Section 901 states that water-based fire protection systems shall be inspected, tested, and maintained in accordance with NFPA 25.
	Sprinkler systems should be inspected at least annually, preferably quarterly.
	Sprinkler heads should be unobstructed. Do not allow residents to hang anything (clothes, decorations, etc.) from sprinkler heads.

Fire Apparatus Access

Access roads for fire apparatus must be properly designed and maintained and unobstructed at all times.

	Approved fire apparatus access roads shall be provided for every facility, building or portion of a building. The fire apparatus access road shall extend to within 150 feet of all portions of the facility and all portions of the exterior wall of the first story of the building as measured by an approved route around the exterior of the building or facility. (IFC 503.1.1)
	The fire code official is authorized to require more than one fire apparatus access road based on the potential for impairment of a single road by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access. (IFC 503.1.2)
	Fire apparatus access roads shall have an unobstructed width of not less than 20 feet (except for approved security gates in accordance with Section 503.6) and an unobstructed vertical clearance of not less than 13 feet 6 inches. (IFC 503.2.1)
	Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be surfaced as to provide all-weather driving capabilities. (IFC 503.2.3)

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	The required turning radius of a fire apparatus access road shall be determined by the code official. (IFC 503.2.4)
	Dead-end fire apparatus access roads in excess of 150 feet in length shall be provided with an approved area for turning around fire apparatus. (IFC 503.2.5)
	Where required by the fire code official approved signs or other approved notices shall be provided for fire apparatus access roads to identify such roads or prohibit the obstruction thereof. Signs or notices shall be maintained in a clean and legible condition at all times and be replaced or repaired when necessary to provide adequate visibility. (IFC 503.3)
	Fire apparatus access roads shall not be obstructed in any manner, including the parking of vehicles. The minimum widths and clearances established in Section 503.2.1 shall be maintained at all times. (IFC 503.4)
	The installation of security gates across a fire apparatus access road shall be approved by the fire chief. Where security gates are installed, they shall have an approved means of emergency operation. The security gates and the emergency operation shall be maintained operational at all times. (IFC 503.6)

EVACUATION

Exits and Exit Signs

All dormitories and residence halls must have at least two exits. These exits must be marked with lighted emergency exit signs.

	Dormitories and residence halls shall have be provided with and have access to a minimum of two (2) independent exits within each story for an occupant load of 1-500, a minimum of three (3) for an occupant load of 5001-1,000, and a minimum of four (4) for an occupant load of more than 1,000. (IFC 1018.1)
	Exits shall be so located on each story of a dormitory or residence hall such that the maximum length of exit access travel, measured from the most remote point within a story to the entrance to an exit along the natural and unobstructed path of egress travel, shall not exceed 200 feet in a building without sprinklers and 250 feet in a building with sprinklers. (IFC 1015.1)
	Exits and exit access doors shall be marked by an approved exit sign readily visible from any direction of egress travel. (IFC 1011.1)
	Exit signs shall be internally or externally illuminated. (IFC 1011.2)
	Exit signs shall be illuminated at all times. (IFC 1011.5.3)
	The means of egress, including the exit discharge, shall be illuminated at all times the building space served by the means of egress is occupied. (IFC 1006.1)

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	The means of egress, including the exit discharge, shall be free of obstructions that would prevent its use, including the accumulation of snow and ice. (IFC 1027.3)
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Stairwells

Interior stairwells provide not only an exit from the building in the event of a fire; they must also provide refuge from fire and smoke. Interior stairwells must be fire-resistant. Stairway doors on each floor must be fire-rated and either self-closing or automatic-closing.

	Interior exit stairways and interior exit ramps shall be enclosed with fire barriers. Exit enclosures shall have a fire-resistance rating of not less than 2 hours where connecting four stories or more and not less than 1 hour where connecting less than four stories. The number of stories connected by the shaft enclosure shall include any basements but not any mezzanines. An exit enclosure shall not be used for any purpose other than means of egress. (IFC 1019.1)
	Where interior exit enclosures (stairwells) are extended to the exterior of a building by an exit passageway, the door assembly from the exit enclosure to the exit passageway shall be protected by a fire door conforming the requirements in Section 714.2 of the <i>International Building Code</i> .(2000) Fire doors shall be self-closing or automatic-closing. (IBC 714.2.7)

Fire Evacuation Drills

It is imperative that well planned fire drills are conducted each semester in each residence hall. The local fire department should be present at each fire drill and student participation must be mandatory.

	A fire emergency guide shall be provided in R-2 occupancies (dormitories and residence halls) which describes the location, function and use of fire protection equipment and appliances accessible to residents, including fire alarm systems, smoke alarms, and portable fire extinguishers. The guide shall also include an emergency evacuation plan for each dwelling unit. (IFC 408.9.1)
	Emergency guides shall be reviewed and approved in accordance with Section 401.2. (Section 401.2 states, Where required by this code, fire safety plans, emergency procedure, and employee training programs shall be approved by the fire code official.) (IFC 408.9.2)
	A copy of the emergency guide shall be given to each tenant prior to initial

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	occupancy. (IFC 408.9.3)
	Fire drills (one announced and one unannounced) should be conducted at least twice each semester.
	Have a representative from the local Fire Dept. participate in every fire drill.
	Students must be required to evacuate the building when an alarm is sounded. Failure to evacuate a residence hall during a fire alarm or a fire drill should result in disciplinary action.
	When a fire alarm sounds, students should leave the building immediately and close and lock their room door as they leave.
	Residence hall staff or campus security should check each floor to ensure that everyone has evacuated the building.
	Urge students to take each alarm and each drill seriously.
	Students should be directed to assemble in pre-designated locations as specified in the emergency evacuation plan.
	Students should remain outside until residence hall staff or fire department officials authorize re-entry to the building.
	Resident Assistants (RAs) and other residence hall staff should be trained to use the emergency evacuation plan. Exercises should be conducted periodically to ensure that residence hall staff knows the plan and can evacuate the building effectively.

Training for Resident Assistants and Other Staff

Residence hall and dormitory staff must be trained to respond to emergencies, particularly fires, which occur in student housing.

	Students and housing staff should be trained to properly notify the fire department using the 911 system. Improper use of 911 notification delays emergency response.
	All dormitory and residence hall staff should be trained to use portable fire extinguishers.
	A fire emergency guide shall be provided in R-2 occupancies (dormitories and residence halls) which describes the location, function and use of fire protection equipment and appliances accessible to residents, including fire alarm systems, smoke alarms, and portable fire extinguishers. The guide shall also include an emergency evacuation plan for each dwelling unit. (IFC 408.9.1) Dormitory and residence hall staff should be familiar with the emergency plan and the fire detection and fire suppression equipment and appliances available in their building.

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Appendix A
Fire Safety Checklist

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<u>FIRE SAFETY CHECKLIST</u>			
University _____	Building Name _____		
Use of Building _____	Date _____		
<hr/> <hr/>			
<input type="checkbox"/> Is there a fire safety awareness program for occupants?		<input type="checkbox"/> Are fire drills conducted?	
<input type="checkbox"/> Does it include cooking, smoking, candles, appliances...?		<input type="checkbox"/> Is local fire department involved in drills?	
<input type="checkbox"/> Is there fire prevention training for occupants?		<input type="checkbox"/> Does fire service inspect annually?	
<input type="checkbox"/> Is there an evacuation plan for building?		<input type="checkbox"/> Where does alarm notify?	
<input type="checkbox"/> Are evacuation routes posted?		<input type="checkbox"/> Where do smoke detectors notify?	
<input type="checkbox"/> _____		<input type="checkbox"/> Name of Fire Department _____	
<hr/>			
Is building address / name easily seen from street? _____			
Can fire trucks access hydrants / standpipes? _____ Upper floors? _____			
Is gas shut-off accessible? _____			
Is electric power shut-off accessible? _____			
What protection systems are present? Fire Extinguishers Standpipes Sprinklers			
Are they adequately placed? _____ Are they inspected annually? _____			
Are smoke detectors in every room? _____			
Are smoke detectors tested every six months? _____			
Are rules for cooking posted in kitchen? _____			
Are fire exists clear and operable? _____ Are exit lights & emergency lighting operable? _____			
Are electrical panels accessible, labeled and properly maintained? _____			
List hazards found: _____ _____			

Appendix B
Evacuation Plan Assessment

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Facility: _____ Occupancy Group: _____

Contents of evacuation plan:

✓	Component
	Emergency egress, escape routes and whether evacuation is to be complete or partially by selected floors or other areas are all identified.
	Procedures for employees who must remain to operate critical equipment before evacuating.
	Procedure for accounting for employees and occupants after evacuation has been complete.
	Identification and assignment of personnel responsible for rescue or emergency medical aid.
	The preferred and any alternative method of notifying occupants of a fire or other emergency.
	The preferred and any alternative means of reporting fires and other emergencies to the fire department or designated emergency response organization.
	Identification of personnel who can be contacted for further information or explanation of duties under the plan.
	A description of the emergency voice/alarm communication system alert tone and preprogrammed voice messages if provided.
	Method for recall/reentry and for removal to remote safety zone.
	Plan reviewed or updated annually or as changes in staff, occupancy or building configuration occur.
	Plan readily available to employees and furnished upon request.
	Employees periodically trained or instructed in assigned duties.
	Drills or exercises conducted _____ times per year.

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Additional Fire Safety Plan Contents:

✓	Component
Site Plans Indicating:	
	Initial assembly points
	Location of fire hydrants
	Routes of ingress for emergency responders
Floor Plans Identifying:	
	Exits
	Primary evacuation routes
	Secondary evacuation routes
	Areas of refuge
	Manual fire alarm boxes
	Portable fire extinguishers or other occupant used suppression device
	Fire alarm enunciators and controls, if equipped
	Personnel assigned duties with regard to emergency response
	Personnel assigned duties with regard to hazard mitigation

Record of actual drill or exercise:

Person conducting drill:

Name: _____ Title: _____

Date: _____ Start Time: _____ End Time: _____

Notification method used:

_____ # of staff members on duty: _____ # of staff members participating: _____

of occupants present: _____ # of occupants evacuated: _____

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Special conditions simulated:

Problems encountered:

Weather conditions during evacuation:
