

Farm Emergency Preparedness Series:

Understanding Preparedness and Response

Understanding Preparedness and Response

PART II, Chapter 1

Understanding Preparedness Guide for Farms and Rural Business

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INTRODUCTION

A fire at a food processing plant results in 25 deaths, a company out of business and a small town devastated.

Every year emergencies take their toll on businesses, farms and agricultural operations — in lives and dollars. But something can be done. Farms, businesses and industry can limit injuries and damages and return more quickly to normal operations (in the event of an emergency) if they plan ahead.

About this Guide

This guide is an adaptation of the *Emergency Management Guide for Business and Industry* published by the Federal Emergency Management Agency for agricultural-based operations.

Whether you operate a fruit farm, raise livestock or nursery; whether you own, rent or lease your property; whether you are a large or small sole proprietorship or LLC; the concepts in this guide will apply.

To begin, you need not have in-depth knowledge of emergency management. What you need is the authority to create a plan and a commitment on a personal basis or from the farm owner to make emergency management part of your management culture.

If you already have an Emergency/Preparedness plan, use this guide as a resource to assess and update your plan.

The guide is organized as follows:

Section 1: 4 Steps in the Planning Process

How to form a planning team; how to conduct a vulnerability analysis; how to develop a plan; and how to implement the plan. The information can be applied to virtually any type of business or industry.

Section 2: Emergency Management

Considerations

How to build such emergency management capabilities as life safety, property protection, communications and community outreach.

Section 3: Hazard-Specific Information

Technical information about specific hazards your facility may face.

What Is an Emergency?

Sometimes an emergency can arise from seemingly unimportant activities, practices or issues. Recognizing an emergency early can minimize the impact an emergency can have on your business.

An emergency is any unplanned event that can cause deaths or significant injuries to employees, customers or the public; or that can shut down your business, disrupt operations, cause physical or environmental damage, threaten food or feed, or threaten the facility's financial standing or public image.

Numerous events can be "emergencies," including:

- Fire
- Hazardous materials incident
- Pesticide incidents
- Manure spill
- Tornado
- Winter storm
- Earthquake
- Communications failure
- Radiological accident
- Civil disturbance
- Terrorist actions
- Loss of key staff
- Loss of key supplier or customer
- Loss of key equipment
- Explosion
- Equipment entanglement
- Bio hazard
- Feed contamination
- Large scale animal illness

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- Food contamination (or threat)

What Is Emergency Management?

Emergency management is the process of preparing for, mitigating, responding to and recovering from an emergency.

In many cases, simply the act of preparing for an emergency can prevent the emergency from occurring. In addition, the preparedness principles used can have a positive affect on the entire operation.

Emergency management is a dynamic, ever changing process. Planning, though critical, is not the only component. Training, conducting drills, testing equipment and coordinating activities with the community are other important functions.

What Is Preparedness?

“Preparedness” - Provides leadership, training, readiness and exercise support, and technical and financial assistance to strengthen citizens, communities, State, local and Tribal governments, and professional emergency workers as they prepare for disasters, mitigate the effects of disasters, respond to community needs after a disaster, and launch effective recovery efforts.” (FEMA)

Making the “Case” for Emergency Management

To be successful, emergency management requires management/owner support. The farm owner, manager, or chief executive sets the tone by authorizing planning to take place and directing management and family to get involved.

Most farm operations as well as most small and medium size businesses do not have full time risk managers. Their resources of time and money are limited. Any new activity will likely be completed at the expense of another activity.

To minimize the cost of implementing preparedness programs, farm and other operations should consider using

emergency management and preparedness principles as part of your everyday management practices.

When presenting the “case” for emergency management, avoid dwelling on the negative effects of an emergency (e.g., deaths, fines, criminal prosecution) and emphasize the positive aspects of preparedness.

For example:

- It helps companies fulfill their moral responsibility to protect employees, the community and the environment.
- It facilitates compliance with regulatory requirements of Federal, State and local agencies.
- It enhances a company’s ability to recover from financial losses, regulatory fines, loss of market share, damages to equipment or products or business interruption.
- It reduces exposure to civil or criminal liability in the event of an incident.
- It enhances a company’s image and credibility with employees, customers, suppliers and the community.
- It may reduce your insurance premiums.
- And, in many cases, increases productivity.

Site Emergency Plan

A site emergency plan describes, in detail, an organization’s policy and procedures for coping with an emergency situation on site. These policies and procedures should define how the organization will protect people and property. Developing the plan is the process of assigning emergency related tasks to individuals in the organization, and outlining protective actions to be taken. A site emergency plan should be consistent with the local government’s emergency operations plan.

Basic Site Emergency Planning

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Listed below are eight basic concepts involved in emergency management planning. The user should keep these eight concepts in mind while writing the plan:

- Appoint one person to implement the emergency plan and direct the organization's response at the site.
- Appoint a person from each work unit to carry out protective actions and other related emergency procedures.
- Establish a central location from which to coordinate response and make key decisions.
- Appoint a single person to validate and coordinate the dissemination of emergency information.
- Establish adequate communication and warning capabilities.
- Establish adequate evacuation procedures and sheltering capabilities.
- Establish damage assessment capabilities.
- Protect vital records.

SECTION 1: FOUR STEPS IN THE PLANNING PROCESS

STEP 1- ESTABLISH A PLANNING TEAM

There must be an individual or group in charge of developing the emergency management plan. Agricultural operations can seek assistance from programs such as the Michigan Agriculture Environmental Assurance Program (MAEAP) http://www.michigan.gov/mda/0,1607,7-125-1567_1599_25432---,00.html through the Michigan Department of Agriculture for certain environmental preparedness planning. The Michigan Department of Labor and Economic Growth provides safety plan materials at http://www.michigan.gov/cis/0,1607,7-154-11407_30453---,00.html and consultation services at http://www.michigan.gov/cis/0,1607,7-154-11407_15317---,00.html

Michigan State University Extension publications are available at county offices and at <http://www.msue.msu.edu/>

Michigan Farm Bureau will have sample forms available at michiganfarmbureau.com the summer of 2006.

See the Appendix to this section for additional resources.

Form the Team

The size of the planning team will depend on the facility's operations, requirements and resources. Usually, involving a group of people is best because:

- It encourages participation and gets more people invested in the process
- It increases the amount of time and energy participants are able to give
- It enhances the visibility and stature of the planning process
- It provides for a broad perspective on the issues
- Provides diverse view points

Determine who can be an active member and who can serve in an advisory capacity. In most cases, one or two people will be doing the bulk of the work. At the very least, you should obtain input from all functional areas of the operation such as production, storage, animal husbandry, and marketing.

Consider internal representatives from these areas:

- Owner
- Production management
- Labor
- Family members
- Maintenance

As well as from external sources such as:

- Safety, health and environmental specialists
- Extension Specialists
- Industry organizations
- Community relations
- Sales and marketing
- Legal

Have participants appointed in writing by the owner or management where the person is not the owner.

If the operation has developed job descriptions emergency management responsibilities should be reflected in this assignment.

Establish Authority

Demonstrate management's commitment and promote an atmosphere of cooperation by "authorizing" the planning group to take the steps necessary to develop a plan. The group should be led by the farm owner, the production manager or the chief executive.

Establish a clear line of authority

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between group members and the group leader, though not so rigid as to prevent the free flow of ideas.

Issue a Mission Statement

Have the farm owner, the production manager or the chief executive issue a mission statement to demonstrate the company's commitment to emergency management. The statement should:

- Define the purpose of the plan and indicate that it will involve the entire organization
- Define the authority and structure of the planning group

- Travel to agricultural and general industry based educational seminars
- Participation in Local Emergency Planning Committee activities
- Hiring an outside consultant to review the operation and assist in completing facility reviews and in developing Emergency Prepared and Response Plan

The budget may be several thousand dollars for a 4500 head dairy operation or may consist of coffee and doughnuts for a farm family.

Our goal is to prepare for emergencies through development of preparedness strategies including following written site emergency plan response procedures to protect people and property during an emergency or disaster situation. This plan identifies and assigns personnel to various emergency tasks and responsibilities, thus creating the Site Emergency Team. This plan provides coordination between the Site Emergency Team response and governmental authorities to ensure an effective response.

Establish a Schedule and Budget

Establish a work schedule and planning deadlines. Time lines can be modified as priorities become more clearly defined.

Develop an initial budget for such things as research, printing, seminars, consulting services and other expenses that may be necessary during the development process.

Consider budget items such as:

- Reference documents such as health and safety standards, industry consensus standards (e.g. NFPA 1600, ANSI), industry organization documents, and training texts

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STEP 2- ANALYZE CAPABILITIES AND HAZARDS

This step entails gathering information about current capabilities and about possible hazards and emergencies, and then conducting a vulnerability (impact) analysis to determine the facility's capabilities for handling emergencies.

The National Fire Prevention Association Standard 1600 (NFPA 1600) provides an excellent outline for comprehensive preparedness procedures.

Hazard Identification, Risk Assessment, and Impact Analysis Under NFPA 1600

Hazard Identification

Complete an assessment (review) to identify hazards, the likelihood of their occurrence, and the vulnerability of family, employees, neighbors/guests, property, the environment, and the entity itself to those hazards.

Hazards to be considered at a minimum shall include, but shall not be limited to, the following:

1. Natural hazards (geological, meteorological, and biological)
2. Human-caused events (accidental and intentional)
3. Physical (engineering and ergonomic)

The hazard identification should include, but is not limited to, the following types of potential hazards:

1. Naturally occurring hazards that can occur without the influence of people and have potential direct or indirect impact on the entity (people, property, the environment)
 - a. Geological hazards (does not include asteroids, comets, meteors)
 - i. Earthquake
 - ii. Landslide, mudslide, subsidence

- b. Meteorological hazards
 - i. Flood, flash flood
 - ii. Drought
 - iii. Fire (forest, range, urban)
 - iv. Snow, ice, hail, sleet
 - v. Windstorm, tornado, water spout, dust/sand storm
 - vi. Extreme temperatures (heat, cold)
 - vii. Lightning strikes
 - c. Biological hazards
 - i. Diseases that impact humans and animals (plague, smallpox, anthrax, West Nile virus, foot and mouth disease)
 - ii. Animal or insect infestation
2. Human-caused events
 - a. Accidental
 - i. Hazardous material (pesticide, fertilizer, chemical, fuel, radiological, biological) spill or release
 - ii. Explosion/fire
 - iii. Transportation accident
 - iv. Building/structure collapse
 - v. Energy/power/utility failure
 - vi. Fuel/resource shortage
 - vii. Air/water pollution, contamination
 - viii. Water control structure/dam/levee failure
 - ix. Well failure
 - x. Financial issues, economic depression, inflation, financial system collapse
 - xi. Communications systems interruptions
 - b. Intentional
 - i. Terrorism (conventional, chemical, radiological, biological, cyber)
 - ii. Sabotage
 - iii. Product tampering
 - iv. Civil disturbance, public unrest, mass hysteria, riot
 - v. Enemy attack, war
 - vi. Insurrection
 - vii. Strike
 - viii. Misinformation
 - ix. Criminal actions

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- (1) Product destruction
- (2) Arson (PETA, Environmental Defense Fund, neighbors)
- x. Electromagnetic pulse
3. Physical
 - a. Engineering
 - i. Shields and guards
 - ii. Electrical
 - iii. Work surfaces
 - iv. Elevated surfaces
 - v. Equipment operation
 - vi. Control equipment
 - vii. Roll Over Protective Structure and seat belt
 - viii. Warning devices and labels
 - ix. Metal fatigue
 - b. Ergonomic
 - i. Design
 - ii. Weight
 - iii. Height
 - iv. Repetitive motion

Risk Assessment and Impact Analysis

The farm operation should conduct an impact analysis to determine the potential for detrimental impacts of the hazards that may be present during normal operations and specifically during normal operations and specifically during emergency conditions including, but not limited to, the following:

1. Health and safety of persons in the affected area at the time of the incident (injury and death)
2. Health and safety of personnel responding to the incident
3. Continuity of operations
4. Property, facilities, and infrastructure
5. Delivery of services
6. The environment
7. Economic and financial condition
8. Regulatory and contractual obligations
9. Reputation of or confidence in the farm operation

Where Do You Stand Right Now?

Review Repetitive Internal Plans and Policies

Documents to look for include:

- Evacuation plan
- Fire protection plan
- Safety and health programs, plans and policies
- Environmental procedures and policies such as MAEAP plans
- Manure spill plan
- Food, feed and hazardous materials, security practices and procedures
- Food safety practices and procedures including HACCP plans
- Bio security procedures
- Insurance programs and underwriting requirements, coverage limits and/or exclusions
- Employee manuals, work rules, and policies
- Hazardous materials plan and reports
- Process safety assessment (eg: anhydrous ammonia storage, tank welding)
- Risk management plan
- Mutual aid agreements
- Employee training programs

Meet with Outside Groups

Meet with government agencies, community organizations, cooperative extension, industry organizations, and utilities. Ask about potential emergencies within your own operation as well as area emergencies that could affect your operation, and about plans and available resources for responding to them. Sources of information include:

- Community Emergency Management Office
- DLEG - MIOSHA CET
- Mayor or Community Administrator's office
- Road Commission
- Local Emergency Planning Committee (LEPC)

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- Fire Department
- Local Police Department
- Michigan State Police
- Emergency Medical Services organizations
- American Red Cross
- National Weather Service
- Public Works Department
- Planning Commission
- Communications companies
- Electric, gas and water utilities
- Neighboring businesses
- suppliers, especially sole source vendors
- Lifeline services such as electrical power, water, sewer, gas, telecommunications and transportation
- Operations, equipment and personnel vital to the continued functioning of the facility
- Veterinary services
- Lab services

While researching potential emergencies, one facility discovered that a dam — 50 miles away — posed a threat to its facility. The facility was able to plan accordingly.

One way to increase response capabilities is to identify employee skills (medical, engineering, communications, foreign language) that might be needed in an emergency.

Identify Codes and Regulations

Identify applicable Federal, State and local legislation, regulations and codes such as:

- Occupational safety and health regulations (See Appendix)
- Environmental regulations
- Fire codes
- Housing regulations
- Building codes
- Seismic safety codes for critical infrastructure
- Transportation regulations
- Zoning regulations
- Food codes
- Worker protection standards
- Community emergency response codes

Identify Critical Products, Services and Operations

You'll need this information to assess the impact of potential emergencies and to determine the need for backup systems.

Areas to review include:

- Company products and services and the facilities and equipment needed to produce them
- Products and services provided by

Identify Internal Resources and Capabilities

Resources and capabilities that could be needed in an emergency include:

- Personnel — fire brigade, hazardous materials response team, emergency medical services, security, emergency management team, evacuation team, public information officer
- Equipment — fire protection and suppression equipment, spill kit, personal protective equipment, communications equipment, first aid supplies, veterinary supplies, emergency supplies, warning systems, emergency power equipment, decontamination supplies and equipment
- Facilities — emergency operating center, media briefing area, shelter areas, refrigeration equipment, livestock care and containment, first-aid stations, sanitation facilities, refrigeration equipment, livestock care/containment
- Organizational capabilities — training, evacuation plan, employee support system
- Backup systems — arrangements with other facilities to provide for:
 - Payroll

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- ▶ Communications
- ▶ Production services
- ▶ Livestock shelter and services
- ▶ Customer services
- ▶ Shipping and receiving
- ▶ Information systems support
- ▶ Emergency power
- ▶ Recovery support

Identify External Resources

There are many external resources that could be needed in an emergency. In some cases, formal agreements may be necessary to define the facility's relationship with the following:

- Local emergency management office
- Fire department
- Hazardous materials response organization
- Emergency medical services
- Hospitals
- Local and state police
- Community service organizations
- Utilities
- Contractors
- Suppliers of emergency equipment
- Insurance carriers
- Other farm operations
- Neighboring property owners

Do an Insurance Review

Meet with your insurance carrier(s) to review all policies and any emergency procedures provisions and business interruption coverage and limits. Underwriting guidelines can provide an audit function for your emergency management planning process.

Conduct a Vulnerability Analysis

The next step is to assess the vulnerability of your facility — the probability and potential impact of each emergency. Use the Vulnerability Analysis Chart (in the appendix) as a guide to the process. The chart specifies the assigning of probabilities, estimating impact and assessing resources,

using a numerical system. The lower the score the better.

Use a simple scale of 1 to 5 with 1 as the weakest resource and 5 as the strongest resource.

List Potential Emergencies

In the first column of the chart, list all emergencies and/or hazards that could affect your facility, including those identified by your local emergency management office. Consider both:

- Emergencies/hazards that could occur within your facility
- Emergencies/hazards that could occur in your community that could impact your farm operation

Below are some other factors to consider:

- **Historical** — What types of emergencies have occurred in the community, at this facility and at other facilities in the area?
 - ▶ Work-related injuries/fatalities
 - ▶ Fires
 - ▶ Severe weather
 - ▶ Hazardous material spills
 - ▶ Transportation accidents
 - ▶ Earthquakes
 - ▶ Hurricanes
 - ▶ Tornadoes
 - ▶ Terrorism
 - ▶ Utility outages
 - ▶ Animal disease
 - ▶ Manure spills
 - ▶ Pesticide spills
 - ▶ Explosion
 - ▶ Flood
 - ▶ Equipment entanglement
 - ▶ Feed contamination
- **Geographic** — What can happen as a result of the facility's location?

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Keep in mind:

- ▶ Proximity to flood plains and dams
- ▶ Soil type
- ▶ Proximity to large wood lots or other fuel sources
- ▶ Proximity to companies that produce, store, use or transport hazardous materials
- ▶ Proximity to major transportation routes and airports
- ▶ Proximity to nuclear powerplants
- ▶ Proximity to aggressive advocacy groups

- **Technological** — What could result from a process or system failure?

Possibilities include:

- ▶ Fire, explosion, hazardous materials incident
- ▶ Safety system failure
- ▶ Security system failure
- ▶ Telecommunications failure
- ▶ Computer system failure
- ▶ Power failure
- ▶ Ventilation system failure
- ▶ Heating/cooling system failure
- ▶ Emergency notification system failure
- ▶ Manure management system failure

- **Human Error** — What emergencies can be caused by employee error?

Are employees trained to work safely? Do they know what to do in an emergency? Human error is the single largest cause of workplace emergencies and can result from:

- ▶ Poor training
- ▶ Poor maintenance
- ▶ Carelessness
- ▶ Misconduct
- ▶ Substance abuse
- ▶ Language barriers
- ▶ Fatigue

- **Physical** — What types of emergencies could result from the design or construction of the facility?

Does the physical facility enhance safety? Consider:

- ▶ The physical construction of the facility
- ▶ Hazardous processes or byproducts
- ▶ Facilities for storing food, feed, combustibles, flammables, pesticides and fertilizers
- ▶ Layout of equipment
- ▶ Storage of large equipment (e.g. combines, tractors)
- ▶ Lighting
- ▶ Evacuation routes and exits
- ▶ Proximity of shelter areas

- **Regulatory** — What emergencies or hazards are you regulated to deal with?

- ▶ Sanitation
- ▶ Food or feed contamination
- ▶ Pesticide and fertilizer spills
- ▶ Drift
- ▶ Placarded Hazardous Material transportation incidents
- ▶ Fatality and multiple hospitalizations

Analyze each potential emergency from beginning to end. Consider what could happen as a result of:

- ▶ Prohibited access to the facility
- ▶ Loss of electric power
- ▶ Communication lines down
- ▶ Ruptured gas mains
- ▶ Water damage
- ▶ Well or water main damage
- ▶ Smoke damage
- ▶ Structural damage
- ▶ Air or water contamination
- ▶ Explosion
- ▶ Building collapse
- ▶ Trapped persons
- ▶ Seriously injured person(s)
- ▶ Chemical release
- ▶ Food contamination
- ▶ Feed contamination
- ▶ Civil unrest
- ▶ Terrorist threat

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Estimate Probability

In the **Probability** column, rate the likelihood of each emergency's occurrence. This is a subjective consideration, but useful nonetheless.

Use a simple scale of 1 to 5 with 1 as the lowest probability and 5 as the highest.

For example: Is there a possibility a foreign or domestic terrorist will target your 5 acre wood lot to infect your trees with a disease? While the possibility exists, the probability is low. On the other hand, what is the probability you may slip and fall while you're alone surveying the wood lot? The probability is substantially higher.

Is there a possibility a serious injury will occur on your 5000-head livestock operation? Not only is it possible, it is also highly probable that a serious injury will occur over time.

Assess the Potential Human Impact

For general emergency preparedness analyze the potential human impact of each emergency — the possibility of death or serious injury.

Assign a rating in the **Human Impact** column of the **Vulnerability Analysis Chart**.

Use a 1 to 5 scale with 1 as the lowest impact and 5 as the highest.

For example: Is it possible for an apple controlled atmosphere storage gas analyzing system to fail? Yes. What is the potential human impact? A lack of oxygen or a low oxygen level is fatal to anyone entering the storage. In this example, the *impact* potential would be high.

Assess the Potential Property/Production Impact

Consider the potential property and

production losses and damages. Again, assign a rating in the **Property/Production Impact** column.

Use a simple scale of 1 being the lowest impact and 5 being the highest.

Consider:

- ▶ Cost to replace
- ▶ Cost to set up temporary replacement
- ▶ Cost to repair

For example: As we determined, it is possible for an apple controlled atmosphere storage gas analyzing system to fail. What is the potential impact to the product? A lack of oxygen could destroy the retail marketability of the apples reducing the value by more than half. In this example, the *impact* potential would be high.

The actual cost to replace certain property may not adequately assess the "opportunity costs" associated with the property. Where opportunity costs are great, such as in the loss of breeding stock, or the damage of a highly perishable product consider rating the impact in more than one area.

For agricultural emergency preparedness we need to assess and rate for the animal or plant production impacts of the emergency that may not fall within the property impact area discussed below.

Assess the Potential Business Impact

Consider the potential loss of market share. Assign a rating in the **Business Impact** column.

Again, 1 is the lowest impact and 5 is the highest. Assess the impact of:

- ▶ Business interruption
- ▶ Employees unable to report to work
- ▶ Customers unable to reach facility
- ▶ Company in violation of contractual agreements
- ▶ Extended legal actions

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- ▶ Boycotts
- ▶ Loss of reputation
- ▶ Imposition of fines and penalties
- ▶ Interruption of critical supplies
- ▶ Interruption of product distribution
- ▶ Loss of key employee/owner

Assess On-farm and Community Resources

Next assess your resources and ability to respond. Assign a score to your **Internal Resources and External Resources**. The lower the score the better.

To help you do this, consider each potential emergency from beginning to end and each resource that would be needed to respond. For each emergency ask these questions:

- ▶ Do we have the needed internal resources and capabilities to respond?
- ▶ Will external resources be able to respond to us for this emergency as quickly as we may need them? If the answers are yes, move onto the next assessment. If an answer is no, identify what can be done to correct the problem. For example, you may need to:
 - ✓ Develop additional emergency procedures
 - ✓ Conduct additional training
 - ✓ Acquire additional equipment
 - ✓ Establish mutual aid agreements
 - ✓ Establish agreements with specialized contractors

where the need is greatest. Or they may be victims themselves and be unable to respond immediately. That means response to your facility may be delayed.

Complete the Subjective Analysis

Add the Columns. Total the scores for each type of emergency. The lower the score the better. While this is a subjective rating, the comparisons will help determine planning and resource priorities — the subject of the pages to follow.

When assessing resources, remember that community emergency workers — police, paramedics, firefighters— will focus their response

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STEP 3- DEVELOP THE PLAN

You are now ready to develop an emergency management plan. This section describes methods to accomplish this task.

Plan Components

Your plan should include the following basic components.

Executive Summary

The executive summary of a comprehensive plan gives the owner, management and others who must be aware of a brief overview of:

- The purpose of the plan
- The facility's emergency management plan, policy or rule
- Authorities and responsibilities of key personnel
- The types of emergencies that could occur
- Where will response operations will be managed

The executive summary can be used to provide basic communication with your neighbors, local businesses, and community members.

Emergency Management Elements

This section of the plan briefly describes the facility's approach to the core elements of emergency management, which are:

- Direction and control
- Communications
- Life safety
- Property, food and feed protection
- Community outreach
- Recovery and restoration
- Administration and logistics

These elements, which are described in detail in Section 2 of this chapter, are the foundation for the emergency procedures that your facility will follow to protect personnel, livestock, food, feed, and equipment and to resume operations after

an emergency has occurred.

Emergency Response Procedures

The procedures spell out how the facility will respond to emergencies as well as certain "near misses" or incidents. Whenever possible, develop them as a series of checklists that can be quickly accessed by the owner, family, senior management, department heads, response personnel, and employees as appropriate.

Determine what actions would be necessary to:

- Assess the situation
- Protect employees, customers, visitors, livestock, food, feed, equipment, vital records and other assets, particularly during the first three days
- Get the business or activity back up and running

Specific procedures might be needed for any number of situations such as animal disease outbreak, floods, bomb threats or tornadoes, and for such functions as:

- Warning employees, family members, customers, suppliers and buyers
- Communicating with internal response personnel as well as community and regulatory responders
- Conducting an evacuation and accounting for all persons in the facility
- Managing response activities
- Fighting fires
- Shutting down operations
- Protecting vital records
- Restoring operations

In an emergency, all personnel should know:

1. What is my role?

2. Where should I go?

Some general industry facilities

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including certain integrated farm operations are required to develop:

- Emergency escape procedures and routes
- Procedures for employees who perform or shut down critical operations before an evacuation
- Procedures to account for all employees, visitors and contractors after an evacuation is completed
- Rescue and medical duties for assigned employees
- Procedures for reporting emergencies
- **Procedures for reporting fatalities and hospitalization of 3 or more workers to 1-800-858-0397**
- Names of persons or departments to be contacted for information regarding the plan
- Entry into confined space
- Fire prevention plan
- Remote rescue procedures

Support Documents

Documents that could be needed in an emergency include:

- Internal emergency call lists -
 - ▶ A comprehensive list of all persons on- and off-site who may need to be contacted or found during an emergency such as the Site Emergency Team, owners and family members (see Appendix for sample list).
 - ▶ A listing of those who would be involved in responding to an emergency, their responsibilities and their 24-hour telephone numbers (wallet size if possible to be carried by key staff)
- Building and site maps (at least one set should be maintained off-site) that indicate:
 - ▶ Utility shut-offs
 - ▶ Water hydrants
 - ▶ Water main valves

- ▶ Water lines
- ▶ Potable and non-potable water sources
- ▶ Gas main valves
- ▶ Gas lines
- ▶ Propane and other compressed gas tank locations
- ▶ Electrical cutoffs
- ▶ Electrical substations
- ▶ Electrical transfer switches
- ▶ Storm drains
- ▶ Sewer lines
- ▶ Location of each building and work area (include name of building/farm, street name and number)
- ▶ Floor plans
- ▶ Alarms and intercom systems
- ▶ Fire extinguishers
- ▶ Fire suppression systems
- ▶ Exits
- ▶ Stairways
- ▶ Designated escape routes
- ▶ Restricted areas such as confined spaces
- ▶ Hazardous materials (including cleaning supplies and chemicals)
- ▶ Livestock confinement areas
- ▶ Food and feed storage
- ▶ High-value items
- ▶ Emergency supplies
- Resource lists - lists of major resources (equipment, supplies, services) that could be needed in an emergency; mutual aid agreements with other companies and government agencies

First responders need to know the location of the emergency. A panic 911 call saying there is a tractor overturn at the Anderson Farm in the Jones field will not provide sufficient information to responders and may delay the response by several minutes. Have a listing of all fields, the street address and nearest cross roads to the field entrance.

The Development Process

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The following is guidance for developing the plan.

Identify Preparedness Issues and Prioritize Activities to Achieve

Determine specific goals and milestones of your plan. Make a list of tasks to be performed, by whom and when. Determine how you will address the problem areas and resource shortfalls that were identified in the hazard identification and risk analysis.

Write the Plan

Assign responsibility and authority for completing your plan. Determine the most appropriate format for each area of the plan. You may consider outside consultants to assist in the development process.

Provide enough time for completion of work, but not so much as to allow the process to stop. Establish a schedule for:

- First draft or outline - Put your thoughts on your current state of preparedness together with examples of policies, procedures, or practices
- Review - After a period of time, such as the following season, review the material for applicability and usefulness to your operation
- Assure compliance - Determine if the plan meets basic compliance requirements
- Consolidate - Bring the material together into a second draft or outline
- Final draft/outline - Consolidate your material into a final document.
- Copy and distribute - Provide copies or summaries to for key staff affected parties as appropriate

Your emergency planning priorities may be influenced by government regulation. To remain in compliance you may be required to address specific emergency management functions that might otherwise be a lower priority activity for that given year.

Establish a Training Program

All staff and family should be aware of the basic plan procedures. Training can be part of the development process (where all key operation staff are part of the development) or formal when new staff are hired or where roles change.

Determine the needs of disabled persons and non-English-speaking personnel. For example, a blind employee could be assigned a partner in case an evacuation is necessary.

The Americans with Disabilities Act (ADA) defines a disabled person as anyone who has a physical or mental impairment that substantially limits one or more major life activities, such as seeing, hearing, walking, breathing, performing manual tasks, learning, caring for oneself or working.

Coordinate with Outside Organizations

Meet periodically with local government agencies, community organizations, area farms, and industry. Inform appropriate government agencies that you are creating an emergency management plan. While their official approval may not be required, they will likely have valuable insights and information to offer.

Determine State and local requirements for reporting emergencies, and incorporate them into your procedures.

Determine protocols for turning control of a response (incident command) over to outside agencies. Some details that may need to be worked out are:

- Which gate or entrance will

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- responding units use?
- Where and to whom will they report?
- How will they be identified?
- How will facility personnel communicate with outside responders?
- Who will be in charge of response activities?

Under most community emergency response procedures an incident commander is determined. In most cases this is the fire chief or similar person. They will have nearly full control of the situation.

You may establish an incident command procedure for your operation. Large operations such as poultry and livestock facilities should strongly consider establishing an incident command structure. The designated incident commander will need additional training and the relationship between the community responders and the site commander should be predetermined.

Determine what kind of identification authorities will require to allow your key personnel into your facility during an emergency.

Consider bio security, animal health, and other hazards present on your operation, or hazards created by outside parties.

During a farm rescue, a family member of the trapped person was detained by the police for interfering in a rescue activity. Communicating who is your operation's incident commander will speed the rescue activities.

Communicate to emergency responders what if any hazards they may encounter during emergency response activities.

Consider these farm-based hazards when developing your response communication procedures:

- ▶ Current status of storage facilities -

- controlled atmosphere storage, silos, grain bins, manure pits, pesticide, fertilizer, chemicals, flammable materials, fuel and veterinary supplies
- ▶ Locations that could contain a hazardous atmosphere, designated confined spaces and permit required confined spaces
- ▶ Location of compressed gas containers
- ▶ Location of livestock and critical livestock facility controls
- ▶ Field conditions
- ▶ Location of buried tanks and supply lines
- ▶ Size and weight of equipment involved

Maintain Contact with Other Farm Operations in Your Neighborhood

Communicate with other farms in your area to learn:

- ▶ What their emergency notification procedures to your operation will be and how you will communicate your procedures to them
- ▶ How farms will support each other in an emergency
- ▶ The conditions where mutual assistance would be necessary and develop any appropriate written agreement(s)
- ▶ Names, telephone numbers, cell numbers, pager numbers, and e-mail of key personnel

Incorporate this information into your emergency plan procedures.

Mutual Aid agreements may need to be reviewed by legal counsel and insurance providers.

Review, Conduct Training, Implement and Revise

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Distribute the first draft or outline to key staff for review. Revise as needed. For a second review, conduct an office exercise with management, family, and personnel who have a key emergency management responsibility. In a conference room setting, describe an emergency scenario and have participants discuss their responsibilities and how they would react to the situation. Based on this discussion, identify areas of confusion and overlap, and modify the plan accordingly.

Consolidate emergency plans for better coordination. Stand-alone plans, such as a Spill Prevention Control and Countermeasures (SPCC) plan, pesticide/fertilizer release plan, drift management plan, fire protection plan, and safety and health plan, should be incorporated into one comprehensive plan or document.

Print Final Document

Obtain written approval from owner or authorized manager.

Remember, there may be parts of the plan such as the procedures to deal with a disgruntled employee, neighbor, or advocacy group that should remain confidential.

Certain food safety and security procedures also need to remain confidential and limited to those who will actively participate in managing the event.

Distribute the Plan

Place the final plan in three-ring binders

and number all copies and pages. Each individual who receives a copy should be required to sign for it and be responsible for posting subsequent changes approved by management. At no time should an unauthorized employee make changes to the plan.

Determine which sections of the plan would be appropriate to show to government agencies (some sections may refer to business secrets or include private listings of names, telephone numbers or radio frequencies).

Distribute the final emergency response plan to:

- ▶ Owner, chief executive and senior managers
- ▶ Key members of the company's emergency response staff
- ▶ Community emergency response agencies (appropriate sections)

Have key personnel keep a copy of the plan in their homes.

Inform employees about the plan and training schedule for emergency preparedness training meetings.

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STEP 4- IMPLEMENT THE PLAN

Implementation means more than simply exercising the plan during an emergency. It means acting on recommendations made during the hazard identification and risk analysis, integrating the plan into company operations, training employees and evaluating the plan.

In some cases capital expenditures will be needed to eliminate identified serious hazards or risks.

Integrate the Plan into Management Operations

Emergency planning must become part of your business culture to be fully effective.

Look for opportunities to build awareness; to educate and train family members, management and personnel; to test procedures; to involve all levels of management, all departments and the community in the planning process; and to make emergency management part of what personnel do on a day-to-day basis.

Test how completely the plan has been integrated by asking:

- ▶ How well does the owner and senior management support the responsibilities outlined in the plan?
- ▶ Have emergency planning concepts been fully incorporated into the operations's accounting, personnel and financial procedures?
- ▶ How can the operation's procedures for evaluating employees and defining job classifications better address emergency management responsibilities?
- ▶ Are there opportunities for distributing emergency preparedness information through company correspondence, notices and employee disclosures?
- ▶ What kinds of safety posters or other visible reminders would be helpful?

- ▶ Do personnel know what they should

do in an emergency?

- ▶ How can all levels of the organization be involved in evaluating and updating the plan?

Conduct Training

Everyone who works at or visits the facility requires some form of training.

This could include periodic employee and family discussion sessions to review procedures, technical training in equipment use for emergency responders, evacuation drills and full-scale exercises. Below are basic considerations for developing a training plan.

Incorporate emergency preparedness procedures with safety, pesticide, and equipment training.

Planning Considerations

Assign responsibility for developing a training plan. Consider the training and information needs for employees, contractors, visitors, family, managers and those with an emergency response role identified in the plan.

Determine for a 12 month period:

- ▶ Who will be trained
- ▶ Who will do the training
- ▶ What training activities will be used
- ▶ When and where each session will take place
- ▶ How the session will be evaluated and documented

Consider how to involve community responders in training activities.

Conduct reviews after each training activity. Involve both personnel and community responders in the evaluation process where appropriate.

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Training Activities

Training can take many forms:

- ▶ **Orientation and Education Sessions** — These are regularly scheduled discussion sessions to provide information, answer questions and identify needs and concerns. These can be including during regular work assignment meetings, over breakfast or lunch, or when the weather halts activities.
- ▶ **Tabletop Exercise** — The emergency management group should meet in a conference room or private setting to discuss their responsibilities and how they would react to emergency scenarios. This is a cost-effective and efficient way to identify areas of overlap and confusion before conducting more demanding training activities. This can be done during the off-season to provide planning information. This is a good time to review past year incident reports to adjust work practices or equipment where appropriate.

Pre-season, pre-planting and pre-harvest discussions should include the hazards and risks associated with the operation.

- ▶ **Walk-through Drill** — The emergency management group and response teams actually perform their emergency response functions. This activity generally involves more people and is more thorough than a tabletop exercise. Many local emergency response organizations are willing to participate in these drills where there are atypical risks present at your operation.

Consider inviting local responders to test their rescue procedures for your operations.

- ▶ **Functional Drills** — These drills test specific functions such as medical response, emergency notifications, warning and communications procedures and equipment, though not necessarily at the same time. Personnel are asked to evaluate the systems and identify problem areas.
- ▶ **Evacuation Drill** — Personnel and family walk the evacuation route to the designated area to test the evacuation procedure and to account for all personnel and family. Participants may be asked to make notes as they go along of what might become a hazard during an emergency, e.g., stairways cluttered with debris, equipment blocking exits, smoke in buildings, locked gates, passing flammable materials storage areas, etc. Plans and procedures should modified accordingly.
- ▶ **Full-Scale Exercise** — A real life emergency situation is simulated as closely as possible. This exercise involves company emergency response personnel, employees, management and community response organizations. Full-scale emergency response exercises could include a community-based extrication drill where responders attempt to “open up” a large piece of old farm equipment where a person could be entangled or trapped.

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Employee Training

General training for all employees should address:

- ▶ Individual roles and responsibilities
- ▶ Information about threats, hazards and risks
- ▶ Protective actions, procedures and equipment
- ▶ Notification, warning and communications procedures
- ▶ Means for locating employees and family members in an emergency
- ▶ Emergency response procedures
- ▶ Evacuation, shelter and accountability procedures
- ▶ Location and use of common emergency equipment
- ▶ Emergency shutdown and start up procedures as appropriate

MIOSHA training requirements are a minimum standard for many general industry facilities including vertically integrated farm operations that have a fire brigade, hazardous materials team, rescue team or emergency medical response team. MIOSHA also specifies annual equipment training for mobile and stationary farm equipment operators.

Provide WPS Central Notification and MSDS location information and training. Identify how pesticide application notifications and new chemical training will be completed.

Evaluate and Modify the Plan

Regularly review and audit the entire plan. Conduct annual reviews and review when a major change is made to operations or facilities. Among the issues to consider:

- ▶ Have the hazards in the facility changed?
- ▶ Are hazard identifications completed on a regular basis?

- ▶ Are the problem areas and resource shortfalls identified in the hazard identification and risk analysis being sufficiently addressed?
- ▶ Does the plan reflect lessons learned from drills and actual events on your operation, in your area, or in the industry?
- ▶ Do members of the emergency management group and emergency response team understand their respective responsibilities? Have new members been trained?
- ▶ Does the plan reflect changes in the physical layout of the facility? Does it reflect new facility processes? Does it reflect new equipment used?
- ▶ Are photographs and other records/lists of facility assets up-to-date?
- ▶ Is the facility attaining its training objectives?
- ▶ Are the names, titles and telephone numbers in the plan current? Are you following privacy requirements for certain personnel information?
- ▶ Are steps being taken to incorporate emergency management into other farm and facility operational processes and work practices?

Have community agencies and organizations been briefed on the plan? Are they involved in evaluating the plan?

In addition to a regular audit, consider evaluation and modification of the plan at these times:

- ▶ When new farms are purchased or leased
- ▶ After each training drill or exercise
- ▶ In response to significant external threats
- ▶ After each emergency
- ▶ When personnel or their responsibilities change
- ▶ When the layout or design of the facility changes
- ▶
- ▶ When policies, procedures or work

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rules change

Remember to brief personnel on changes to the plan.

When siting a new location, conduct a hazard analysis for preparedness and safety and health issues in addition to the production and environmental aspects of the area. Modify your plan when a new site becomes operable.

SECTION 2: EMERGENCY MANAGEMENT CONSIDERATIONS

Direction and Control

Someone must be in charge in an emergency. The system for managing resources, analyzing information and making decisions in an emergency is called direction and control.

For many farm operations, the owner may be the only worker during several periods of the year, and therefore, will need to be solely responsible for the plan. Consider assigning emergency activities to family members who may or may not be active in day-to-day farm operations.

The direction and control system described below assumes a medium to large facility. Your facility will likely require a less sophisticated system; though the principles described here will assist you in determining what practices to implement for your operation.

Most community response organizations have received training in this system or a similar system. Understanding the terms used for emergency response can expedite rescue and general response activities.

The configuration of your emergency management program will depend on many factors. Larger operations may have their own fire team, emergency medical and veterinary technician(s) or a hazardous materials response team. While smaller operations may need to rely on community response and, potentially, mutual aid agreements with other farm or industry operations. They may also be able to consolidate positions or combine responsibilities with other farms or local businesses.

Emergency Management Group (EMG)

The Emergency Management Group is the team responsible for the big picture. It controls all incident-related activities. The Incident Commander (IC) oversees the technical aspects of the response.

The Emergency Management Group supports the Incident Commander by providing resources and assisting in communications with the community, the media, outside response organizations and regulatory agencies.

The Emergency Management Group is headed by the Emergency Director (ED), who should be the farm owner or facility manager. The ED is in command and control of all aspects of the emergency. Other Emergency Management Group members should be senior managers or community members who have the authority to:

- ▶ Determine the short- and long-term effects of an emergency
- ▶ Order the evacuation or shutdown of the facility
- ▶ Communicate with outside organizations and the media
- ▶ Issue press releases

Incident Command System (ICS)

The ICS was developed specifically for the fire service, but its principles can be applied to all emergencies. The ICS provides for coordinated response and a clear chain of command to maintain safe response operations.

In a hazardous materials accident, an off-site medic was exposed to the spilled material and required hospitalization. It was determined that the person was able to enter the hazardous area unprotected because no one among a host of managers and facility responders was “in charge” at the scene.

The Incident Commander is responsible for:

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- ▶ Front-line management of the incident
- ▶ Tactical planning and execution
- ▶ Determining whether outside assistance is needed
- ▶ Relaying requests for internal resources or outside assistance through the Emergency Operations Center (EOC)

Note: See **Coordination of Outside Response** below.

The internal Incident Commander can be any employee, but a member of management with the authority to make decisions is usually the best choice. The internal Incident Commander must have the capability and authority to:

- ▶ Assume command
- ▶ Assess the situation
- ▶ Implement the emergency management plan(s)
- ▶ Determine response strategies
- ▶ Activate resources
- ▶ Order an evacuation
- ▶ Oversee all incident response activities
- ▶ Declare that the incident is “over”

Emergency Operations Center (EOC)

The Emergency Operations Center serves as a centralized management center for emergency operations. Here, decisions are made by the Emergency Management Group based upon information provided by the internal Incident Commander and other personnel. Regardless of size or process, every farm or facility should designate an area where decision makers can gather during an emergency.

The Emergency Operations Center should be located in an area of the farm or facility not likely to be involved in an incident, perhaps the manager’s office, a conference room or even the home of a family member or employee. An alternate Emergency Operations Center should be designated in the event that the primary

location is not usable.

Each facility must determine its requirements for an Emergency Operations Center based upon the functions to be performed and the number of people involved. Ideally, the Emergency Operations Center is a dedicated area equipped with communications equipment, reference materials, activity logs and all the tools necessary to respond quickly and appropriately to an emergency.

Emergency Operations Center Resources:

- ▶ **Communications equipment**
- ▶ **A copy of the Emergency Management Plan(s), Health and Safety Plans/Procedures, and Emergency Operations Center procedures**
- ▶ **Blueprints, maps, status boards**
- ▶ **A list of Emergency Operations Center personnel, their contact information and descriptions of their duties**
- ▶ **Technical information (such as pesticide labels and MSDS) and data for advising responders**
- ▶ **Building security system information**
- ▶ **Bio-security information**
- ▶ **Information and data related to management and response capabilities**
- ▶ **Telephone directories and emergency call lists**
- ▶ **Backup power, communications and lighting**
- ▶ **Emergency supplies**

Planning Considerations

To develop a direction and control system:

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- ▶ Define the duties of personnel with an assigned role, establish procedures for each position, prepare checklists for all procedures
- ▶ Define procedures and responsibilities for fire fighting, medical and health, and engineering
- ▶ Determine lines of succession to ensure continuous leadership, authority and responsibility in key positions
- ▶ Determine equipment and supply needs for each response function
- ▶ Assign responsibility to all personnel for:
 - Recognizing and reporting an emergency
 - Warning other employees in the area
 - Taking security and safety measures
 - Evacuating safely
- ▶ Provide training
- ▶ Establishing temporary barriers after livestock disease outbreak
- ▶ Spill containment (sorbent pads, sand, etc.) in the path of leaking pesticides or other materials
- ▶ Closing food and feed process areas
- ▶ Securing food and feed storage areas
- ▶ Locking file cabinets or desk drawers

Only trained personnel should be allowed to perform advanced security measures such as spill containment of pesticides with the skull and crossbones warning on the label.

Access to the facility, the Emergency Operation Center, and the incident scene should be limited to persons directly involved in the response.

Coordination of Outside Response

In some cases, laws, codes, prior agreements, or the very nature of the emergency require the farm's or facility's Incident Commander to turn operations over to an outside response organization.

When this happens, the protocols established between the farm and outside response organizations are implemented. The farm or facility's Incident Commander provides the community's Incident Commander a complete report on the situation.

The farm or facility Incident Commander keeps track of which organizations are on-site and how the response is being coordinated as well as providing site-specific hazard and in many cases operational information. This helps increase personnel and livestock safety, response action accountability, and prevents duplication of effort.

Farm emergencies do happen. In many cases the farm owner or primary farm manager can be seriously injured, suffer debilitating medical problems (on or off the job) or killed. Family farm operations, in particular, need to complete a succession planning process to assure production continues during and after a medical emergency.

Site or Event Security

Isolation of the incident scene must begin when the emergency is discovered. If possible, the discoverer should attempt to secure the scene and control access, but no one should be placed in physical danger to perform these functions.

Basic security measures include:

- ▶ Establishing temporary barriers after people have been safely evacuated

Keeping a detailed log of actions taken during an emergency can assist in legal actions, incident re-creation and/or future planning. Describe what

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happened, decisions made, and any deviations from policy or procedures. Log the time for each event.

Communications

Communications are essential to any business operation. A communications failure can be a disaster in and of itself, cutting off vital business activities.

Communications are needed to report emergencies, to warn personnel of the danger, to keep families and off-duty employees informed about what's happening at the facility, to coordinate response actions, and to keep in contact with customers and suppliers.

Communication Contingency Planning

Plan for all probable as well as possible contingencies from a temporary or short-term disruption to a total communications failure.

- ▶ Consider the everyday functions performed by your facility and the communications, both voice and data, used to support them
- ▶ Consider the business impact if your communications were inoperable
 - How would this impact your emergency operations?
- ▶ Prioritize all facility communications
 - Determine which should be restored first in an emergency
 - Establish procedures for restoring communications systems
- ▶ Talk to your communications vendors about their emergency response capabilities
- ▶ Determine needs for backup communications for each business function

Emergency Communications

Consider the communications functions your facility might need to perform in an

emergency and the systems needed to support them. Your determination here should be used when updating your overall communications equipment and features available.

Communications between the farm and remote production areas may require different equipment or subscriptions to achieve the same level of service.

A farm owner was seen wearing three cell phones. He explained; "This phone works on the north side of the valley, this phone only works on the south (side of the valley), and the Nextel® only works by the lake."

Consider communications between:

- ▶ Internal Emergency Responders
- ▶ Internal Emergency Responders and the Internal Incident Commander (IC)
- ▶ The internal Incident Commander and the facility Emergency Operations Center (EOC)
- ▶ The internal Incident Commander and employees
- ▶ The Emergency Operations Center and outside response organizations and government agencies
- ▶ The Emergency Operations Center and neighboring businesses
- ▶ The Emergency Operations Center and employees' families
- ▶ The Emergency Operations Center and customers/suppliers
- ▶ The Emergency Operations Center and media

Methods of communication include but are not limited to:

- Messenger/runner
- Telephone (land line or mobile)
- Two-way FM radio
- FAX machine
- Microwave
- Satellite (phone or data)
- Dial-up, high speed, or satellite modems

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- Local area networks
- Hand, light and flag signals

Family Communications

In an emergency, personnel will need to know whether their families are okay. Taking care of one's loved ones is always a first priority.

Make plans for communicating with farm family and employees' families in an emergency. If you hire migratory workers, consider adding emergency contact information to your employment documentation procedures. Make sure you have the entire phone code if the number is an international number.

While performing initial startup testing of a new tank system a contractor fell from an eight-foot step ladder resulting in closed head injuries. The contractor was air-lifted from the farm for treatment. The farm operation implemented their emergency plan and communicated with the contractor's family.

Seasonal and migratory agricultural workers can present a significant problem as family members may not even reside in the country.

If you hire contractors, such as a Farm Labor Contractor or construction contractor, on a regular basis consider how you will communicate with the contract employer or the contract workers' family members.

Encourage employees to:

- ▶ Consider how they would communicate with their families in case they are separated from one another or injured in an emergency

- ▶ Arrange for an out-of-town or out-of-country contact family member the employer could call in an emergency

This system should provide a two-way system allowing worker's family members to contact the migratory or seasonal worker through the employer in case they are having an emergency.

A fruit operation in west Michigan, at the beginning of the season, provided workers residing at their farm with contact procedures for in-country and out-of-country emergency contact information. The farm instructed the workers to send the information to their family members. When a hurricane struck central Mexico this process was used by not only the operation's workers, but by several workers in the area.

Designate a place to meet or to leave messages for family members in case they cannot get home in an emergency. For most farms, the farm family's emergency plans should be incorporated into the business emergency plan as most family members are "on-call" 24 hours a day or are subject to the hazards present on the farm whether or not they are working.

Consider how you would access important personal information about employees (home phone, next-of-kin, medical) in an evacuation emergency.

Notification

Establish procedures for employees to report an emergency. Inform employees and post instructions, where appropriate, the procedures for emergency reporting. Train personnel assigned to specific notification tasks such as spill reporting and those designated to communicate with the family members of an injured worker.

Test warning systems regularly. One company conducted its first test of a sophisticated alarm system 21 years after the system was installed. Rather

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than alarm bells, the system played Christmas music.

Post internal and external emergency telephone numbers near each telephone, on employee bulletin boards and in other prominent locations such as in service and worker transport vehicles.

Maintain an updated list of addresses and telephone numbers of key emergency response personnel from within and outside the facility (see Appendix).

Listen for tornado, thunderstorm and other severe weather warnings issued by the National Weather Service. Establish a weather procedure for the severe weather likely to occur in your area.

A star highschool basketball player was discing a field of wheat as it was harvested. With dark clouds looming and a couple of rounds to go, the farmer, needing to empty a full hopper, told the young man to finish discing and the farmer would be right back to finish before the storm hit.

When the farmer returned the tractor was not moving and the young man was slumped over the steering wheel. Lighting, in advance of the storm, had struck the tractor, killing the young man.

Determine government agencies' notification requirements in advance. Notification must be made immediately to local, state, and/or federal government agencies when various emergencies (such as chemical release, certain animal diseases, or product tampering) has the potential to affect public health and safety.

Prepare announcements that could be made over public address systems or communication equipment within your operation or be issued to the media in case of a disaster such as a manure containment facility breach.

Warning

For fixed work locations, establish a system for warning personnel of an emergency. The system should:

- ▶ Be audible or within view by all people in the facility
- ▶ Have an auxiliary power supply
- ▶ Have a distinct and recognizable signal
- ▶ Be designed to provide remote location warning if necessary

Make plans for warning persons with disabilities. For instance, a flashing strobe light can be used to warn hearing-impaired people.

Familiarize personnel with procedures for responding when the warning system is activated.

Establish procedures for warning customers, contractors, visitors and others who may not be familiar with the facility's warning system.

Test your facility's warning system regularly and at least at the start of each season. For ongoing production facilities, test on a monthly basis.

Test communications often. A research firm discovered in a drill that its two-way radio system did not work, limiting communications between the Emergency Operations Center (EOC) and the Incident Commander (IC) to a single telephone line. The Emergency Management Group had failed to provide a backup radio for the Emergency Operations Center. Fortunately, this was discovered during training.

Life Safety

Protecting the health and safety of everyone in the facility is the first priority during an emergency. Each operation should then prioritize other areas such as animal safety and health, product storage, environmental risks, etc.

Evacuation Planning

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One common means of protection is evacuation. In the case of fire, an immediate evacuation to a predetermined area away from the facility may be necessary.

To develop an evacuation policy and procedure:

- ▶ Determine the conditions under which an evacuation would be necessary
- ▶ Establish a clear chain of command
- ▶ Identify personnel with the authority to order an evacuation.
- ▶ Designate “evacuation wardens” to assist others in an evacuation and to account for personnel
- ▶ Establish specific evacuation procedures
- ▶ Establish a system for accounting for personnel.
- ▶ Consider employees’ transportation needs at remote work area evacuations
- ▶ Establish procedures for assisting persons with disabilities and those who do not speak English
- ▶ Post evacuation procedures, facility evacuation maps and assembly area maps
- ▶ Designate evacuation sites and assembly areas at remote locations
- ▶ Designate personnel to continue or shut down critical operations while an evacuation is underway - they must be capable of recognizing when to abandon the operation and evacuate themselves
- ▶ Coordinate plans with the local emergency management office or emergency response organization

During many farm work practices there will only be one person present. If a fire breaks out, always contact someone first, (other workers or emergency response), prior to making a decision to fight the fire.

Evacuation Routes and Exits

Designate primary and secondary evacuation routes and exits. Have them clearly marked and well lit where there are active operations. At a minimum post exit signs.

Install emergency lighting, in areas such as milk parlor basements and feed blending rooms, in case a power outage occurs during an evacuation.

Ensure that evacuation routes and emergency exits are:

- ▶ Wide enough to accommodate the number of evacuating personnel
- ▶ Clear and unobstructed at all times
- ▶ Unlikely to expose evacuating personnel to additional hazards

Assembly Areas and Accountability

Obtaining an accurate account of personnel after a site evacuation requires planning and practice.

- ▶ Designate assembly areas where personnel should gather after evacuating
- ▶ Take a head count after the evacuation
 - The names and last known locations of personnel not accounted for should be determined and given to the Emergency Operations Center and or first responders (confusion in the assembly areas can lead to unnecessary and dangerous search and rescue operations)

- ▶ Establish a method for accounting for non-employees such as family members, suppliers, and customers
- ▶ Establish procedures for further evacuation in case the incident expands; this may consist of sending employees home by normal means

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- or providing them with transportation to an off-site location
- ▶ Evacuation could expand to surrounding facilities, farms and residences

Shelter

In some emergencies, the best means of protection is to take shelter either within the facility or away from the facility in a public building.

- ▶ Consider the conditions for taking shelter, e.g., tornado warning, cloud to ground lightning
- ▶ Identify shelter space in the facility, field or in the community
- ▶ Establish procedures for sending personnel to shelters
- ▶ Determine needs for emergency supplies such as water, food, medical and veterinary supplies
- ▶ Designate shelter managers, if appropriate
- ▶ Coordinate plans with local authorities

Search and rescue should be conducted only by properly trained and equipped professionals. Death or serious injury can occur when untrained employees reenter a damaged or contaminated facility.

Training and Information

Train employees in evacuation, shelter and other safety procedures. Conduct sessions at least annually or when:

- ▶ Employees are hired
- ▶ Evacuation wardens, shelter managers and others with special assignments are designated
- ▶ New equipment, materials or processes are introduced
- ▶ Procedures are updated or revised
- ▶ Exercises show that employee performance must be improved

Provide emergency information such as checklists and evacuation maps. Post evacuation maps in strategic locations. Consider the information needs of customers and others who visit the facility.

Family Preparedness

Consider ways to help employees prepare their families for emergencies. This will increase their personal safety and help the facility get back up and running. Those who are prepared at home will be better able to carry out their responsibilities at work.

Farm employees and their families during an emergency may be impacted more than the farm causing key staff not to report to work.

During a community disaster such as a flood or tornado farm operations may be called upon to provide assistance

Property Protection

Protecting facilities, equipment, livestock and vital records is essential to restoring operations once an emergency has occurred.

Planning Considerations

Establish procedures for:

- ▶ Fighting fires
- ▶ Containing pesticide, chemical, fertilizer and material spills
- ▶ Closing or barricading doors and windows, work areas, equipment
- ▶ Shutting down equipment
- ▶ Starting backup equipment
- ▶ Covering or securing equipment
- ▶ Moving equipment to a safe location
- ▶ Moving livestock to a secure location
- ▶ Segregating diseased livestock

Identify sources of backup equipment, parts and supplies. Designate personnel to

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authorize, supervise and perform a facility shutdown. Train them to recognize when to abandon the effort. Obtain materials to carry out protection procedures and keep them on hand for use only in emergencies.

Protection Systems

Determine needs for systems to detect abnormal situations, provide warning and protect property.

Consider:

- ▶ Fire protection systems
- ▶ Lightning protection systems
- ▶ Water-level monitoring systems
- ▶ Temperature and humidity monitoring systems
- ▶ Ventilation monitors
- ▶ Inclinator warning systems
- ▶ Toxic gas monitors
- ▶ Overflow detection devices
- ▶ Flow meters
- ▶ Motion detection systems
- ▶ Automatic shut-offs
- ▶ Bearing temperature monitors
- ▶ Power supply monitors
- ▶ Electrical panel temperature monitors
- ▶ Emergency power generation systems

The MIOSHA Part 77. Grain Handling Facilities, Part 78. Storage and Handling of Anhydrous Ammonia and Part 91. Process Safety Management of Highly Hazardous Chemicals standards provide information on monitoring equipment and activities for certain work activities done by farm operations.

Consult your property insurer about special protective system requirements for certain facilities and equipment they insure.

Mitigation

Consider ways to reduce the effects of emergencies, such as moving or constructing facilities away from flood plains, storing farm equipment away from pesticide and chemical storage areas and clearing brush and weeds from around buildings. Also consider ways to reduce the chances of emergencies from occurring, such as changing processes or materials used such as using a non-flammable parts cleaner.

Consider physical retrofitting measures such as:

- ▶ Upgrading facilities to withstand high winds
- ▶ “Floodproofing” facilities by constructing flood walls/dikes or other flood protection devices and maintaining drainage systems
- ▶ Installing fire sprinkler systems
- ▶ Installing fire-resistant materials near common sources of ignition
- ▶ Installing storm/security shutters for all exterior windows and doors

There are also non-structural mitigation measures to consider, including:

- ▶ Minimize the use of toxic materials
- ▶ Moving sensitive equipment and computer work stations away from large windows
- ▶ Installing flame retardant curtains or panels in welding areas
- ▶ Provide covers for intake, exhaust, and access vents that can prevent contaminants and rodents from entering equipment in the off season

Facility Shutdown

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Facility shutdown is generally a last resort but always a possibility. Improper or disorganized shutdown can result in confusion, injury, and property damage.

Some facilities require only simple actions such as turning off a key on equipment, locking doors and activating alarms. Others require complex shutdown procedures.

A feed mill determined, during a Hazard Identification review, that only one person (who was on vacation at the time) knew how to shut down or restart the 30+ year-old boiler. The operation developed a pictorial procedure guide for both emergency shutdown and restart procedures and trained enough staff to allow one trained person to be on-site or on-call at all times.

Work with supervisors and equipment operators to establish regular and emergency shutdown procedures. Include information about when and how to shut off utilities.

Identify:

- ▶ The conditions that could necessitate a shutdown
- ▶ Who can order a shutdown
- ▶ Who will carry out shutdown procedures
- ▶ How a partial shutdown would affect other facility operations
- ▶ The length of time required for shutdown and restarting

A water pump motor in a dairy tank room began to smoke. The worker, without training, went to the power panel to turn off the pump. The panel was not labeled so the worker switched off breakers until the pump stopped.

He tried to call the owner at his home but there was no answer and no answering machine. The worker

continued to milk putting a note on the motor and left at the end of his shift.

Also switched off was the refrigeration system.

Train personnel in proper shutdown procedures. Family members, who are not actively involved with the operation or equipment, may be the only people on the property during parts of the year and should be trained about emergency shutdown procedures. Youth should be given basic information regarding emergency shutdown procedures for certain types of equipment or instructed how to get help.

Develop written procedures (sometimes called Standard Operating Procedures (SOPs)) and post procedures as appropriate.

Consider written procedures for the following types of operations:

- Irrigation
- Manure handling
- Stationary equipment
- Chemical, pesticide and fertilizer transfer equipment
- Tractors, harvesters and other self-propelled equipment
- Augers
- Drying equipment
- Heating and ventilation
- Utilities

The written procedures can be a step by step process providing the entire operating procedure, SOPs, or they could provide just enough detail explaining the emergency shutdown procedure.

Records Preservation

Vital records may include:

- Financial and insurance information

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- Production records
- Contracts and sales agreements
- Delivery tickets
- Engineering plans and drawings
- Product lists and specifications
- Inventory and asset lists
- Employee, customer and supplier databases
- Formulas and trade secrets
- Personnel files

Take photographs or videotape the facility to document company assets. Update these records regularly.

Preserving vital records is essential to the quick restoration of operations.

Analyzing vital records involves:

1. Classifying operations into functional categories, e.g., finance, production, storage, sales, administration
2. Determining essential functions for keeping the business up and running
3. Identifying the minimum information that must be readily accessible to perform essential functions, e.g., maintaining customer collections may require access to account statements
4. Identifying the records that contain the essential information and where they are located and backed up
5. Identifying the equipment and materials needed to access and use the information

Next, establish procedures for protecting and accessing vital records. Among the many approaches to consider are:

- Labeling vital records and storing in fire-rated cabinets
- Backing up computer systems
- Making copies of records
- Storing tapes and disks in insulated containers
- Storing data off-site where it would

not likely be damaged by an event affecting your facility

- Increasing security of computer facilities
- Arranging for evacuation of records to backup facilities
- Backing up systems handled by service bureaus (e.g.: Tele-Farm)
- Arranging for data system backup power

Community Outreach

Your facility's relationship with the community will influence your ability to protect personnel and property and return to normal operations in a timely fashion.

Involving the Community

Maintain a dialogue with community leaders, emergency responders, government agencies, community organizations and utilities, including but not limited to:

- Appointed and elected leaders
- Fire, police and emergency medical services personnel
- Local Emergency Planning Committee (LEPC) members
- Emergency Management Director
- Public Works Department
- American Red Cross
- Hospitals
- Communication companies
- Utility providers
- Neighborhood groups

Attend or hold regular meetings with community emergency personnel to review emergency plans and procedures. Talk about what you're doing to prepare for and prevent emergencies. Explain your concern for the community's welfare as well as the welfare of your farm operation.

Identify ways your facility could help the

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community in a community-wide emergency.

Look for common interests and concerns. Identify opportunities for sharing resources and information.

Conduct confidence-building activities such as selected-area facility tours with community leaders. Do a full facility walk-through (recognizing food safety and security issues) with community response groups.

Involve community fire, police and emergency management personnel in drills and exercises. Many organizations are seeking locations to train both full-time and volunteer response staff.

Meet with your neighbors to determine how you could assist each other in an emergency.

A large apple grower with several storage units sought out local electrical company workers who would likely be called to respond to power problems. The operation provided facility tours of the operation and asked the utility employees about what would happen in case of problems with the decades old transformers. The workers found they did not have replacement transformers for the particular application in stock. The grower updated the equipment in the off season before a failure occurred in the equipment.

Mutual Aid Agreements

Typically, mutual aid agreements have been developed between government organizations and allow response groups to cross jurisdictional lines.

To avoid confusion and conflict in an emergency, consider establishing mutual aid agreements or similar documents with local response agencies, as necessary, and with other farms and businesses.

Review with your local response agency their qualifications and available equipment necessary for the types of emergencies you have determined are possible on your operation.

A worker at a grain farm entered a grain bin to dislodge sloping grain from against a side wall. The grain released all at once covering the worker. The local fire/rescue was not prepared with equipment or skills for this type of rescue. A neighboring rescue organization was called delaying the rescue operations.

These agreements should:

- Define the type of assistance, equipment or facilities
- Identify the chain of command for activating the agreement
- Define communications procedures
- Provide for liability and/or indemnity protections

Include representatives of these agencies and businesses in facility training exercises whenever possible.

Mutual aid agreements can address any number of activities or resources that might be needed in an emergency.

Mutual Aid Agreement topics:

- **Providing for firefighting and HAZMAT response**
- **Providing shelter space, emergency storage, emergency supplies, medical support**
- **Providing equipment for emergency response procedures and cleanup activities**
- **Businesses allowing neighbors to use their property to account for**

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personnel after an evacuation

- **Livestock care**
- **Planting or harvesting**
- **Temporary storage**

Community Service

In community-wide emergencies, business and industry are often needed to assist the community with:

- Personnel
- Equipment
- Shelter
- Training
- Storage
- Feeding facilities
- Emergency Operations Center facilities
- Food, clothing, building materials
- Funding
- Transportation

While there is no way to predict what demands will be placed on your company's resources, give some thought to how the community's needs might influence your corporate responsibilities in an emergency. Also, consider the opportunities for community service before an emergency occurs.

A fruit grower who was suffering medical problems was at risk of losing his crop when he was in the hospital. Several growers in the community sent their harvest crews, ladders and forklifts to the operation and harvested the crop.

Public Information

When site emergencies expand beyond the facility, the community will want to know the nature of the incident, whether the public's safety or health is in danger, what is

being done to resolve the problem and what was done to prevent the situation from happening.

Determine the audiences that may be affected by an emergency and identify their information needs. Include:

- The public
- The media
- Employees and retirees
- Unions
- Contractors and suppliers
- Customers
- Shareholders
- Emergency response organizations
- Regulatory agencies
- Appointed and elected officials
- Special interest groups
- Neighbors

The community wants to know:

- **What does the facility do?**
- **What are the hazards?**
- **What programs are in place to respond to emergencies?**
- **How could a site emergency affect the community?**
- **What assistance will be required from the community?**

Media Relations

In an emergency, the media are the most important link to the public. Try to develop and maintain positive relations with media outlets in your area. Determine their particular needs and interests. Explain your plan for protecting personnel and preventing emergencies.

Determine how you would communicate important public information through the media in an emergency.

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- Designate a trained spokesperson and an alternate spokesperson
- Set up a media briefing area
- Establish security procedures
- Establish procedures for ensuring that information is complete, accurate and approved for public release
- Determine an appropriate and useful way of communicating technical information
- Prepare background information about the facility

When providing information to the media during an emergency:

Do's

- Give all media equal access to information
- When appropriate, conduct press briefings and interviews
- Give local, state, and/or national media equal time
- Try to observe media deadlines
- Escort media representatives to ensure safety
- Keep records of information released
- Provide press releases when possible

Don'ts

- Do not speculate about the incident
- Do not permit unauthorized personnel to release information
- Do not cover up facts or mislead the media
- Do not place blame for the incident

Press releases about facility-generated emergencies should describe who is involved in the incident and what happened, including when, where, why and how.

Recovery and Restoration

Business recovery and restoration, or business resumption, goes right to a

facility's bottom line: keeping people employed and the business running.

Planning Considerations

Consider making contractual arrangements with vendors for such post-emergency services as records preservation, equipment repair, earthmoving or engineering.

Meet with your insurance carriers to discuss your property and business resumption policies.

Determine critical operations and make plans for bringing those systems back on-line. The process may entail:

- Repairing or replacing equipment
- Restocking of livestock
- Relocating operations to an alternate location
- Remediation of contaminated soil or buildings
- Contracting operations on a temporary basis

Continuity of Management

You can assume that not every key person will be readily available or physically at the facility after an emergency. Ensure that recovery decisions can be made without undue delay. Consult your legal advisor regarding state laws and corporate bylaws governing continuity of management.

Establish procedures for:

- Assuring the chain of command
- Maintaining lines of succession for key personnel
- Moving to alternate headquarters

Include these considerations in all exercise scenarios.

Insurance

Most companies discover that they are

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not properly insured only after they have suffered a loss. Lack of appropriate insurance can be financially devastating. Discuss the following topics with your insurance advisor to determine your individual needs.

- How will my property be valued?
- Does my policy cover the cost of required facility and equipment upgrades to local, state or national codes?
- How much insurance am I required to carry to avoid becoming a co-insurer?
- What perils or causes of loss does my policy cover and more importantly exclude?
- What are my deductibles?
- What does my policy require me to do in the event of a loss?
- What types of records and documentation will my insurance company want to see?
- Are asset and other records in a safe place where they can be obtained after an emergency?
- To what extent am I covered for loss due to interruption of power?
 - Is coverage provided for both on- and off-premises power interruption?
 - What about brown-outs or power surges?
- Am I covered for lost income in the event of business interruption because of a loss?
 - Do I have enough coverage?
 - For how long is coverage provided?
 - How long is my coverage for lost income if my business is closed by order of a civil authority?
- To what extent am I covered for reduced income due to customers not all immediately coming back once the business reopens?
- What insurance information do I need from or are required to provide suppliers and contractors?
- Do I need “hold harmless” and/or

“subrogation” language in service and sales contracts?

- Do I need product liability insurance?
 - What perils are covered and excluded?
- Are there any policies that will protect workers in the event of business interruption?
 - Are current employee plans extendable by the employee?
- How will my emergency management program, safety program and/or security program affect my rates?

Employee Support

Since employees who will rely on you for support after an emergency are your most valuable asset, consider the range of services that you could provide or arrange for, including:

- Cash advances
- Salary continuation
- Flexible work hours
- Reduced work hours
- Crisis counseling
- Care packages
- Day care
- Insurance continuation

After a site emergency, assess the impact of the event on business neighbors and the community and take appropriate action. How you handle this issue will have long-lasting consequences.

Resuming Operations

Immediately after an emergency, take steps to resume operations.

- Establish a recovery team, if

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- necessary
- Establish priorities for resuming operations
- Continue to ensure the safety of personnel on the property
- Assess remaining hazards and any additional hazards created by the emergency
- Maintain security at the incident scene and for the operation
- Conduct an employee briefing
- Keep detailed records including incident reports, interviews, actions take and government contacts
- Consider audio recording all decisions
- Take photographs of or videotape the damage or incident location
- Account for all damage-related costs, however minor
- Establish special job order numbers and charge codes for purchases and repair work related to the emergency
- Follow notification procedures
 - Notify employees' families about the status of personnel on the property
 - Notify off duty personnel about work status
 - Notify insurance carriers and appropriate government agencies
- Protect undamaged property including responder equipment, personal property and worker's property
 - Close up building openings
 - Remove smoke, water and debris
 - Protect equipment against moisture
 - Restore sprinkler or other fire prevention systems
 - Physically secure the property or post notifications
 - Restore power and other utilities
- Conduct an investigation
 - Coordinate actions with appropriate government agencies, local authorities, and legal representative
 - Implement recall program as necessary
- Conduct salvage operations
 - Segregate damaged from undamaged property
 - Adhered to food and feed safety and security practices
 - Keep damaged goods on hand until an insurance adjuster has visited the premises, but you can normally move material outside if it's seriously in the way and exposure to the elements won't make matters worse
- Take an inventory of damaged goods
 - This is usually done with the adjuster, or the adjuster's salvage company if there is any appreciable amount of goods or value
 - If you release goods to the salvage company, obtain a signed inventory stating the quantity and type of goods being removed
- Restore equipment and property
 - For major repair work, review restoration plans with the insurance adjuster and appropriate government agencies such as code and zoning offices
 - Consult MIOSHA safety standard requirements
- Assess the value of damaged property
 - Determine actual cash value and replacement value
 - Consider "opportunity costs" for the equipment of facility
 - Consider outside appraisal
- Assess the impact of business interruption
- Maintain contact with customers and suppliers
 - Keep them informed
 - Speculation will normally work against your relationship

Administration and Logistics

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Maintain complete and accurate records at all times to ensure a more efficient emergency response and recovery. Certain records may also be required by regulation, by your insurance carrier(s), or prove invaluable in the case of legal action after an incident.

Administrative Actions

Administrative actions prior to an emergency include:

- Establishing a written emergency management plan
- Establishing a written health and safety program
- Establishing a written food safety and security plan
- Establishing a written hazardous materials transportation security plan
- Maintaining training records
- Maintaining all written communications
- Documenting drills and exercises and their critiques
- Involving community emergency response organizations in planning activities

Administrative actions during and after an emergency include:

- Maintaining telephone logs including who was contacted and the contact information
- Keeping a detailed record of events immediately preceding, during and after the event
- Maintaining a record of injuries, illnesses, and fatalities and follow-up actions
- Report of workplace fatality to MIOSHA within eight hours
- Accounting for personnel
- Coordinating notification of family members
- Issuing press releases
- Maintaining sampling records
- Managing finances
- Coordinating personnel services
- Documenting incident investigations and recovery operations

Logistics

Before an emergency, logistics may entail:

- Acquiring equipment
- Stockpiling supplies
- Designating emergency facilities
- Establishing training facilities
- Establishing mutual aid agreements
- Preparing a resource inventory

During an emergency, logistics may entail the provision of:

- Providing utility maps to emergency responders
- Providing material safety data sheets to employees and responders
- Moving backup equipment in place
- Repairing parts
- Arranging for medical support, food and transportation
- Arranging for shelter facilities
- Providing for backup power
- Providing for backup communications

SECTION 3: HAZARD-SPECIFIC INFORMATION

Fire

Fire is the most common of all the hazards. Every year fires cause thousands of deaths and injuries and billions of dollars in property damage.

Planning Considerations

Consider the following when developing your plan:

- Meet with the fire department to talk about the community's fire response capabilities
 - Talk about the specifics of your operations, such as animal facility ventilation requirements
 - Maintain current information in your Emergency Tube
 - Identify processes and materials that could cause or fuel a fire, or contaminate the environment in a fire
- Have your facility inspected for fire hazards
 - Ask about fire codes and regulations
 - Ask the responder if they can use on-site water supplies
- Ask your insurance carrier to recommend fire prevention and protection measures; they may also offer training
- Distribute fire safety information to employees:
 - How to prevent fires in the workplace
 - How to contain a fire
 - How to evacuate the facility
 - Where to report a fire
 - Instruct them to crawl on their hands and knees when escaping a hot or smoke-filled area
- Conduct evacuation drills
- Post maps of evacuation routes in prominent places

- Keep evacuation routes including

- stairways and doorways clear of debris and equipment
- Assign "fire wardens" for each area to monitor shutdown and evacuation procedures
- Establish procedures for the safe handling and storage of flammable liquids and gases
- Establish procedures to prevent the accumulation of combustible materials such as grain dust, packing materials and oily rags
- Provide for the safe disposal of smoking materials
- Establish a preventive maintenance schedule to keep equipment operating safely
- Place fire extinguishers in appropriate locations, trucks and key equipment
- Train employees in use of fire extinguishers
- Install smoke and carbon monoxide detectors
- Check smoke and other detectors once a month, change batteries at least once a year such as during the spring solstice and during the winter solstice or as recommended by the manufacturer
- Establish a system for warning personnel of a fire, consider installing a fire alarm with automatic notification to the fire department
- Consider installing a sprinkler system, fire hoses and fire-resistant walls and doors
- Ensure that key personnel are familiar with all fire safety systems
- Identify and mark all utility shut-offs so that electrical power, gas or water can be shut off quickly by "fire wardens" or responding personnel, update Emergency Tubes
- Determine the level of response your facility will take if a fire occurs
Among the options are:

Option 1 — Immediate evacuation of all personnel on alarm

Option 2 — All personnel are trained

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in fire extinguisher use. Personnel in the immediate area of a fire attempt to control it. If they cannot, the fire alarm is sounded and all personnel evacuate.

Option 3 — Only designated personnel are trained in fire extinguisher use.

Option 4 — A fire team is trained to fight incipient-stage fires that can be controlled without protective equipment or breathing apparatus. Beyond this level fire, the team evacuates.

Option 5 — A fire team is trained and equipped to fight structural fires using protective equipment and breathing apparatus.

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Hazardous Materials Incidents

Hazardous materials are substances that are either flammable or combustible, explosive, toxic, noxious, corrosive, oxidizable, an irritant or radioactive.

A hazardous material spill or release can pose a risk to life, health or property. An incident can result in the evacuation of a few people, a section of a facility, or an entire neighborhood.

There are a number of Federal laws that regulate hazardous materials, including: the Superfund Amendments and Re-authorization Act of 1986 (SARA), the Resource Conservation and Recovery Act of 1976 (RCRA), the Hazardous Materials Transportation Act (HMTA), the Occupational Safety and Health Act (OSHA) through the Michigan Occupational Safety and Health Act (MIOSHA), the Toxic Substances Control Act (TSCA) and the Clean Air Act the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA).

In addition to federal laws, state agencies such as the Department of Labor and Economic Growth, the Department of Environmental Quality, the Michigan State Police, and the Michigan Department of Agriculture, enforce hazardous material incident regulations.

Laws such as Title III of SARA regulate the packaging, labeling, handling, storage and transportation of hazardous materials. The law requires facilities to furnish information about the quantities and health effects of materials used at the facility, and to promptly notify local and State officials whenever a significant release of hazardous materials occurs.

In addition to on-site hazards, you should be aware of the potential for an off-site incident affecting your operations. You should also be aware of hazardous materials used in facility processes such as anhydrous ammonia in refrigeration systems and construction materials such as certain forms of insulating materials.

Detailed definitions as well as lists of hazardous materials can be obtained from the Environmental Protection Agency (EPA) and the Federal Occupational Safety and Health Administration (OSHA) or Michigan Department of Environmental Quality (see Appendix).

Planning Considerations

Consider the following when developing your plan:

- Identify and label all hazardous materials stored, handled, produced and disposed of by your facility
- Follow government regulations that apply to your facility
- Obtain material safety data sheets (MSDS) for all hazardous materials at your location
- Ask the local fire department for assistance in developing appropriate response procedures
- Train employees to recognize and report hazardous material spills and releases
- Train employees in proper handling and storage
- Establish a hazardous material response plan:
 - ▶ Establish procedures to notify management and emergency response organizations
 - ▶ Establish procedures to warn employees of an incident
 - ▶ Establish evacuation procedures
 - ▶ Depending on your operations size, organize and train an emergency response team to confine and control hazardous material spills in accordance with applicable regulations
- Identify other facilities in your area that use hazardous materials and determine whether an incident could affect your facility
- Identify highways, railroads and waterways near your facility used for the transportation of hazardous materials and determine how a transportation accident near your facility could affect your operations

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Agrichemical Spill Management and Response

General Safety

1. Secure Personal Safety
2. Develop Emergency Planning - SARA Title III - PIP Plans (New Core Manual for Pesticide Applicator Training)
3. Worker Protection Standard - Personal Protective Equipment requirements
4. OSHA / MIOSHA Personal Protective Equipment use and care, recovery and cleanup activities
5. Michigan Poison Control System 800-POISON-1 (800-764-7661)

4 C's

1. Control
2. Contain
3. Comply w/ Reporting Requirements
4. Clean Up

Response and Notification Procedures

1. Personal safety first
2. Control/Stop the source if possible contain the spill to a small area
3. Prevent contact with surface and ground water
4. Notify Local Emergency Response Personnel, If needed
 - a. LEPC - This contact may also cover State reporting requirements
 - b. Fire / Police
5. MDEQ PEAS Hotline (800-292-4706)
 - a. ALL Uncontained Spills
 - b. Covers requirement for notifying State Emergency Response Committee (SERC)
6. MDA Ag Pollution Emergency Assistance (800-405-0101)
 - a. ALL Pesticide, Fertilizer, and Manure Spills
 - b. Remediation and Land Application/Disposal Options
 - c. Cooperation with MDNR
 - d. Financial Assistance Possibilities
7. National Response Center

(800-424-8802)

- a. If Reportable Quantity under Title III List of Lists
 - b. Sara Title III - Hazardous Materials - Extremely Hazardous Materials
8. Cleanup spill or contact private response company for assistance

Agencies that can Offer Assistance

1. ChemTrec Hotline (800-424-9300)
 - a. Generally for transportation incidents. Can offer product information as well as response guidelines
 - b. Can put you in touch with manufacturer of product
2. MDEQ Waste Management Division (517-373-2730)
 - a. Can offer assistance on disposal of wastes
3. MDA Pesticide & Plant Pest Management Division - Lansing (517-373-1087)
4. MDA Regional Offices
5. MDA Groundwater Program - (517-335-6544)

Floods and Flash Floods.

Floods are the most common and widespread of all natural disasters. Most communities in the United States and in Michigan can experience some degree of flooding after spring rains, heavy thunderstorms or winter snow thaws.

Most floods develop slowly over a period of days. Flash floods, however, are like walls of water that develop in a matter of minutes. Flash floods can be caused by intense storms or dam failure. Localized flash floods can occur where farm retention ponds are located near critical facilities.

Planning Considerations

Consider the following when preparing for floods:

- Ask your local emergency management office whether your facility is located in a flood plain. Learn the history of flooding in your area. Learn the elevation of your facility in relation to streams, rivers and dams.
- Review the community's emergency plan. Learn the community's evacuation routes. Know where to find higher ground in case of a flood.
- Establish warning and evacuation procedures for the facility. Make plans for assisting employees who may need transportation. Establish a livestock evacuation plan.
- Inspect areas in your facility subject to flooding. Identify records and equipment that can be moved to a higher location or have real-time backup systems. Make plans to move records and equipment in case of flood.
- Purchase a NOAA Weather Radio with a warning alarm tone and battery backup. Listen for flood watches and warnings.

Flood Watch — Flooding is possible. Stay tuned to NOAA radio. Be prepared to evacuate. Tune to local radio and television stations for additional information.

Flood Warning — Flooding is already occurring or will occur soon. Take precautions at once. Be prepared to go to higher ground. If advised, evacuate immediately.

- Ask your insurance carrier for information about flood insurance. Regular property and casualty insurance does not cover flooding.
- Consider the feasibility of flood-proofing your facility. There are three basic types of methods.
 1. Permanent flood-proofing measures are taken before a flood occurs and require no human intervention when flood waters rise. They include:
 - a. Filling windows, doors or other openings with water-resistant materials such as concrete blocks or bricks. This approach assumes the structure is strong enough to withstand flood waters.
 - b. Installing check valves to prevent water from entering where utility and sewer lines enter the facility.
 - c. Reinforcing walls to resist water pressure. Sealing walls to prevent or reduce seepage.
 - d. Building watertight walls around equipment or work areas within the facility that are particularly susceptible to flood damage.
 - e. Constructing flood walls or levees outside the facility to keep flood waters away.
 - f. Elevating the facility on walls, columns or compacted fill. This approach is most applicable to new construction, though many types of buildings can be elevated.

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2. Contingent flood-proofing measures are also taken before a flood but require some additional action when flooding occurs. These measures include:
 - a. Installing watertight barriers called flood shields to prevent the passage of water through doors, windows, ventilation shafts or other openings.
 - b. Installing permanent watertight doors.
 - c. Constructing movable flood walls.
 - d. Installing permanent pumps to remove flood waters.
3. Emergency flood-proofing measures are generally less expensive than those listed above, though they require substantial advance warning and do not satisfy the minimum requirements for watertight flood-proofing as set forth by the National Flood Insurance Program (NFIP). They include:
 - a. Building walls with sandbags
 - b. Constructing a double row of walls with boards and posts to create a “crib,” then filling the crib with soil.
 - c. Constructing a single wall by stacking small beams or planks on top of each other.
 - d. Consider the need for backup systems:
 - i. Portable pumps to remove flood water.
 - ii. Alternate power sources such as generators or gasoline-powered pumps.
 - iii. Battery-powered emergency lighting
 - e. Participate in community flood control projects.

Tornadoes

Tornadoes are incredibly violent local storms that extend to the ground with whirling winds that can reach 300 mph.

Spawned from powerful thunderstorms,

tornadoes can uproot trees and buildings and turn harmless objects into deadly missiles in a matter of seconds. Damage paths can be in excess of one mile wide and 50 miles long.

Tornadoes can occur in any state but occur more frequently in the Midwest, Southeast and Southwest. They occur with little or no warning.

Planning Considerations

Purchase a NOAA Weather Radio with a warning alarm tone and battery backup. Listen for tornado watches and warnings.

Tornado Watch — Tornadoes are likely. Be ready to take shelter. Stay tuned to radio and television stations for additional information.

Tornado Warning — A tornado has been sighted in the area or is indicated by radar. Take shelter immediately.

The following are considerations when planning for tornadoes:

1. Ask your local emergency management office about the community's tornado warning system.
2. Establish procedures to inform personnel when tornado warnings are posted. Consider the need for spotters to be responsible for looking out for approaching storms.
3. Work with a structural engineer or architect to designate shelter areas in your facility. Ask your local emergency management office or National Weather Service office for guidance.
4. Consider the amount of space you will need. Adults require about six square feet of space.
5. The best protection in a tornado is usually an underground area. If an underground area is not available, consider:

- a. Small interior rooms on the

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- lowest floor and without windows.
- b. Hallways on the lowest floor away from doors and windows.
- c. Rooms constructed with reinforced concrete, brick or block with no windows and a heavy concrete floor or roof system overhead.
- d. Protected areas away from doors and windows

Note: Buildings that are covered with a flat, wide-span roof are not considered safe.

- Make plans for evacuating personnel away from lightweight modular offices or mobile home-size buildings. These structures offer no protection from tornadoes.
- Conduct tornado drills.
- Once in the shelter, personnel should protect their heads with their arms and crouch down.

Severe Winter Storms

Severe winter storms bring heavy snow, ice, strong winds and freezing rain. Winter storms can prevent employees and customers from reaching the facility, leading to a temporary shutdown until roads are cleared. Heavy snow and ice can also cause structural damage and power outages.

Planning Considerations

Listen to NOAA Weather Radio and local radio and television stations for weather information.

Winter Storm Watch — Severe winter

weather is possible.

Winter Storm Warning — Severe winter weather is expected.

Blizzard Warning — Severe winter weather with sustained winds of at least 35 mph is expected.

Traveler's Advisory — Severe winter conditions may make driving difficult or dangerous.

Following are considerations for preparing for winter storms:

- Establish procedures for facility shutdown and early release of employees.
- Store food, water, blankets, battery-powered radios with extra batteries and other emergency supplies for employees who become stranded at the facility.
- Provide a backup power source for critical operations.
- Arrange for snow and ice removal from parking lots, walkways, loading docks, etc.

Technological Emergencies.

Technological emergencies include any interruption or loss of a utility service, power source, animal life support system, information system or equipment needed to keep the business in operation.

Planning Considerations

The following are suggestions for planning for technological emergencies:

- Identify all critical operations, including:
 - ▶ Utilities including electric power, gas, water, hydraulics, compressed air, municipal and internal sewer systems, wastewater treatment services.
 - ▶ Security and alarm systems, elevators, lighting, life support systems, heating, ventilation and

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- air conditioning systems,
electrical distribution system.
- ▶ Manufacturing equipment,
pollution control equipment.
- ▶ Communication systems, both
data and voice computer
networks.
- ▶ Transportation systems including
air, highway, railroad and
waterway.
- Determine the impact of service
disruption.
- Ensure that key safety and
maintenance personnel are
thoroughly familiar with all building
systems.
- Establish procedures for restoring
systems. .Determine need for
backup systems.
- Establish preventive maintenance
schedules for all systems and
equipment.

Appendix

Vulnerability Analysis Chart

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Michigan Department of Agriculture - Agrichemical Spill Incident Reporting Form

Site Emergency Team List

Emergency Response Phone Number List

Vulnerability Analysis Chart

TYPE OF EMERGENCY/HAZARD	Probability	Human Impact	Property/ Production Impact	Business Impact	Internal Resources	External Resources	Total
	High Low 5 <-----> 1	High Impact	5 <-----> 1	Low Impact	Weak 5 <-----> 1 Resources	Strong Resources	

The lower the score the better

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MDA's Agriculture Pollution Emergency Hotline

Effective early July 1995, the Michigan Department of Agriculture (MDA) installed a new tollfree, 24-hour hotline for reporting manure, fertilizer, or pesticide spills. The Agriculture Pollution Emergency hotline, 1-800-405-0101, is designed for use by agrichemical users. They will be able to gain immediate access to appropriate technical assistance, regulatory guidance for remediation, and common sense approaches for taking care of the problem.

Legislative amendments to the Natural Resources and Environmental Protection Act, Act 451, P.A. of 1994, occurred during June of 1995. These amendments provided MDA with the responsibility to initiate response activities to immediately stop or prevent further releases at agrichemical spill sites. Previous to these amendments, any uncontained release or spill of agrichemical was required to be reported to the Michigan Department of Environmental Quality (MDEQ), most likely through the Pollution Emergency Alerting System (PEAS) hotline. Now, whether a spill is reported through the MDA or MDEQ hotline, MDA will be responsible for initiating the response, which may include assistance and interaction with the MDEQ.

We see this program being very beneficial to both the ag-based industries, as well as those with a specific focus on environmental protection. The MDA hotline will provide another avenue for individuals with problem situations involving agrichemicals to receive help in a timely manner with a common sense approach. As some people do not feel comfortable with contacting the MDEQ, some incidents go unresolved. MDA involvement can reduce the uncertainty and apprehension tied to contacting the State regarding a spill by providing a complete package for spill response. This complete package includes state agency involvement and documentation; technical assistance and knowledge of products involved; practical, effective remediation options; and immediate response. Assistance will be offered to those in need and the spill will get cleaned up as quickly and completely as possible.

P.A. 451 and Regulation 637 (Pesticide Use) provide the legal authority to land apply recovered materials contaminated with pesticides. MDA will utilize land application as the primary method of re-use/disposal to take care of as many spill incidents as possible. Land application involves knowing the upper level of concentrations present, application at or below labeled rates, and application only to labeled sites. As seen in the recent past, this gets the material back out to where it can be used for its intended purpose, rather than land filling or incinerating at a great expense.

Along with installing the MDA hotline, MDA has been working closely with the Michigan State University Extension (MSU-E) and Natural Resource Conservation Service (NRCS) to provide educational materials and informative seminars on how to deal with agrichemical spills. These include a spill management and response flow chart and contacts, informational fliers, and an updated and improved SARA Title III bulletin.

The basic themes that MDA will continue to present in the educational part of this program are to utilize your knowledge about the product, always consider personal safety, use the four C's (Control the source, Contain the spill to smallest area possible, Comply with reporting requirements, Cleanup), keep it out of the water, get help, ask for assistance, and take care of the problem IMMEDIATELY. By using your knowledge and training, involving the appropriate agencies, obtaining assistance when needed, and acting quickly and responsibly, we can greatly reduce the potential risks to groundwater and the environment without going broke in the process.

To recap, the MDA hotline does not replace the MDEQ PEAS hotline for reporting agrichemical spills. However, it does provide an additional method of contact with the State, and more directly to the MDA, for reporting an agrichemical spill and receiving technical assistance. MDA will be working in cooperation with MDEQ to address agrichemical spills but MDA is responsible for initiating the response. We are concentrating on the main goal of cleaning up all agrichemical spills quickly and completely and getting the recovered material back out to where it can be used for its intended purpose. To reach this goal, the MDA spill response program will provide immediate response, technical assistance, and a common sense approach to cleanup for those involved in the spill or release of a manure, fertilizer, or pesticide.

For more information on this program, contact the MDA Pesticide and Plant Pest Management Division, Office of Pollution Prevention Groundwater Program, at 517/241-0236.

Report any pesticide, fertilizer or manure spills to:

Michigan Department of Agriculture

AGRICULTURE POLLUTION EMERGENCY HOTLINE

1-800-405-0101

General agriculture information questions should be directed to MDA's general information number at 1-800-292-3939

Michigan Department of Agriculture - Agrichemical Spill Incident Record Form

Agriculture Pollution/Spills Hot Line: 1-800-405-0101

(For non-agriculture related spills, contact the DEQ at 1-800-292-4706)

This 24-hour hot line should be used for reporting accidental agricultural pesticide, fertilizer and manure spills. (Chemical spills not agriculture-related should be referred to the Michigan Department of Environmental Quality's Pollution Emergency Alerting System (PEAS) number, 1-800-292-4706.)

Name of Owner	
Business Name	
Address (Street City Zip County Twp)	
Telephone Number	
Applicator Involved / Certification Number	
Location of Spill (Address / Identification)	
Complainant (Name Address Phone)	
Other Agencies Contacted / Notified	
Date and Time of Spill Occurrence	
Controlled / Contained / Cleaned Up	
Date and Time of MDA Notification	
Type of Spill (Pesticide or Fertilizer Involved)	
Volume of Spill	
Tank Mix Volume	
Individual Concentration(s) within Tank Mix	
Target Crop / Rate / Acreage	
Product Name(s)	
Active Ingredient(s)	
Type and Form of Product(s) (i.e. herbicide)	
Ag or Non-Ag Use	
Manufacturer(s)	
Manufacturer Telephone Number	
EPA Registration Number(s)	
Spill Site - Soil / Water / Pavement	
Area Covered / Impacted	
Ground Cover Present	
Soil Condition / Type / Slope	
Location of Wells / Drains / Ditches / Surface	
Environmental Hazards	
Health Hazards	
Leaching and Runoff Potential(s)	
Reportable Quantity(ies)	

Site Emergency Team List

Emergency Position	Name/Work Area	Telephone/Cell/Pager
Owner/Manager		
Alternate Owner/Manager		
Site Emergency Coordinator		
Alternate Site Coordinator		
Farm or Facility Manager/Crewleader		
Farm or Facility Manager/Crewleader		
Farm or Facility Manager/Crewleader		
Farm or Facility Manager/Crewleader		
Warning/Communications		
Emergency Assessment		
Emergency Information		
Emergency Maintenance		
Emergency Medical		
Emergency Security		

Emergency Response Phone Number List

General Manager		
Safety Consultant		
Insurance Contact Information		
Contract Number:		
Agent:		
Chemtrec Emergency Hotline (Info Only)	(800) 424-9300	
Local Coast Guard	(313) 568-9580	
US Coast Guard: General Number	(202) 267-2229	
US Coast Guard: Emergency Line (same RRRS)	(800) 424-8802	
National Response Center Hotline	(800) 424-8802	
Fed. Motor Carrier (DOT) State Office	(517) 377-1866	373-6271, 322-1190
Fed. Motor Carrier Regional Office	(708) 283-3577	
Fed. Motor Carrier National Office	(800) 832-5660	
Michigan Department of Agriculture - Agriculture Pollution Emergency Hotline	(800) 405-0101	(517) 335-6544
EPA Region V	(312) 353-2000	
Mich. Dept. of Natural Resources - Pollution Emergency Alerting System Hotline	(800) 292-4706	
National Pesticides Information Network	(800) 858-7378	
Local Railroad	(800) 601-7630	
Federal Railway	(312) 353-6203	
Fed Occupational Safety & Health Admin	(800) 582-1708	
MI Department of Labor & Economic Growth	(517) 322-1831	
MDLEG - WORK RELATED FATALITY REPORTING	(800) 858-0397	(call within 8 hrs)
Michigan Environmental Assistance Center	(517) 373-9400	
U.S. Department of Agriculture: General Number	(202) 720-8732	
U.S. Department of Agriculture: Meat/Poultry Hotline	(800) 535-4555	
USDA Office of Crisis Planning Emergency Line	(202) 720-5711	
State Emergency Response Commission (SERC)	(800) 292-4706	
Local Emergency Planning Committee (LEPC)		
Local Emergency Management		
Fed. Aviation Administration	(312) 694-7412	
Local Arson Tip Line		
Bureau of Alcohol, Tobacco and Firearms: General #	(202) 927-8500	
USBATF Hotline to report suspicious behavior	(800) 800-3855	
FBI: Local Number		
FBI: State Number (Detroit Office)	(313) 965-2323	

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FBI: Federal Number	(202) 324-3000	
Drug Enforcement Administration: Local Number		
Drug Enforcement Administration: State Number	(313) 234-4000	
Drug Enforcement Administration: Federal Number	(202) 307-7363	
US Secret Service	(989) 497-0580	Saginaw
Poison Control Center	(800) 222-1222	
Poison Control (local)		
Local Police Department -		
Local Police Department -		
State Police		
MSP Motor Carrier Division	(517) 336-6195	Lansing HQ
Fire Department -		
Hospital -		
Clinic		
Ambulance Companies -		
Electric Company-		
Gas Emergencies-		
Water Department-		
Sewer Department		
County Health Department		
Local Street Department	(989) 345-1128	
County Road Commission		
Spill Cleanup Companies		
Towing Companies		
Towing Companies		
Dump Truck & Excavator Company		
Dump Truck & Excavator Company		
Dog Catcher		

Farm Emergency Preparedness Series:

Understanding Preparedness and Response

Hazard Identification Procedures

PART II, Chapter 2

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IDENTIFYING AND ASSESSING HAZARDS

1. Introduction
2. Definitions
3. Principles of hazard identification, assessment and control
4. Identifying and assessing health hazards
5. Identifying and assessing safety hazards
6. Controlling hazards

INTRODUCTION

Identifying, assessing and controlling hazards is one of the most important preparedness functions your operation can undertake. This section discusses how you can protect the health and safety of yourself, your family, your workers and others who may enter your farm as well as the safety of your product.

This guide is designed to assist those who are responsible for safety and health on farm operations. The guide provides procedures to identify hazards, assess risks present on the farm operation, and implement control measures to prevent or reduce the likelihood of the identified hazards to cause injury or product contamination.

This guide will:

1. Provide an understanding of what hazards are and how to identify them;
2. Explain what safety and health risks are and how to quantify them;
3. Explain basic farm safety, health and security issues; and
4. Introduce strategies for control or mitigation of risks caused by the identified hazards.

Definitions

What Is a Hazard?

A hazard is any activity, situation, material or substance that can cause harm. A hazard is anything with the potential to harm life, health, property or the environment. Occupational hazards are divided into two broad categories:

- (1) Health hazards, and
- (2) Safety hazards.

Generally, health hazards cause occupational illnesses, such as noise induced hearing loss (NIHL). Safety hazards cause physical harm, such as cuts, broken bones and so forth. Hazards exist in all workplaces.

Food safety hazards can be broadly divided into:

- (1) Naturally occurring, and
- (2) Manmade hazard.

The manmade hazards can be unintentional or intentional, such as, tampering or other malicious, criminal, or terrorist actions.

In this guidance we will focus on occupational hazards and introduce food safety and security issues that dovetail with both the hazard identification and control processes.

Hazard identification is the process of identifying all hazards in the workplace.

In order to understand what hazard identification involves, it is first necessary to understand the nature of hazards. Hazards are the main cause of occupational health and safety problems. Therefore, finding ways of eliminating hazards or controlling the associated risks is the best way to reduce workplace injury and illness.

The same principles hold for food safety and security and are the basis for comprehensive preparedness planning.

Hazard Identification Procedures

Some examples of general farm hazards - and an identified risk include:

- An unguarded bench grinder wheel - a broken wheel could be propelled across the shop
- A missing power take off shaft shield - has the potential to draw a worker's clothing and limbs around the shaft causing serious bodily injury or death
- Handling of flammable liquids in the presence of ignition sources - fire or explosion
- Contact with anhydrous ammonia - severe skin burns, respiratory edema
- Power tools and hand tools - cuts and lacerations, burns, eye damage
- Driving of large farm equipment on narrow rural roads or on fast traffic state roads - contact with other traffic and stationary roadside objects causing serious injury to the operator of other vehicle occupants
- Unshielded roller chain or v-belt - severe laceration, amputation or death
- Using an older chainsaw - cuts from a blade without anti-kickback and no chain brake
- Noise from an older chainsaw which can reach levels of up to 110 dB - serious permanent damage to hearing
- Operation of a tractor without a Roll Over Protection Structure (ROPS) on a slope or near a ditch - crushing injury, suffocation, death
- Badly designed or broken shovel (for example, a short handle and very large blade) - back injury
- Entering a controlled atmosphere storage or silo without proper ventilation - suffocation and death
- Type III ladder - serious injury due to collapse from being overloaded

What is an occupational injury?

Occupational injuries occurring on agricultural operations are usually caused

by contact with equipment or animals or during a slip or fall. In a recent survey, the majority of agricultural work injuries (61%) occurred to the operator of the farm or a farm family member, followed by hired labor (29%), and partners in the farm or their family members (6%). Ninety-five percent of these injuries were temporary, with 4% being permanent in nature. About 80% of these injured workers sought medical attention, beyond first-aid, of some kind.

These injuries most commonly involved anatomical locations of the leg, knee, or hip (17%), followed by back (15%), and finger (12%). Finally, the leading nature of injury was a sprain or strain (26%), followed by fractures (18%), and cuts (17%).

(Traumatic Injuries in Agriculture, David L. Hard, et.al University of Minnesota, School of Public Health

<http://www.cdc.gov/nasd/docs/d001701-d001800/d001773/d001773.html>

What is an occupational illness?

Occupational illnesses are usually caused by health hazards. An occupational illness is a condition that results from exposure to a chemical or biological substance, a physical agent (an energy source such as noise) or other stressors (including harassment, work demands and so forth) capable of causing harm. The time that it takes an illness to develop after exposure to a health hazard is called the "latency period."

Examples of farm-related occupational illnesses include:

- Asbestosis
- Silicosis
- Elevated blood lead levels
- "Farmers, Millers, or Brown Lung"
- Other work-related lung diseases (asthma)
- Noise-induced hearing loss
- Skin diseases
- Certain cancers associated with chemical use and prolonged sun exposure
- Fatigue-related disorders

Hazard Identification Procedures

- Blood borne pathogens instigated illnesses
- Tuberculosis

Examples of activities causing illnesses include:

- Certain veterinary medications in a syringe - some have no antidote may cause human injury or death if injected into the worker
- Certain pesticides absorbed by the worker's skin, inhaled to the lungs, or splashed in eyes - multiple skin and lung risks as well as long term occupational illness
- Waste oil from engine oil changes - injury due to skin absorption of oil contaminates
- Welding Flash - skin and retina burns
- A food container, such as a pop bottle, used to store a pesticide - severe illness if accidentally or intentionally consumed

How do hazards arise?

Hazards may arise from the workplace environment, equipment, the use of plants or substances, unintentional or intentional acts or omissions, and from work practices. Hazards can arise in many different ways and can take various forms. In order to be in a position to properly undertake hazard identification, it is important to understand the sources of hazards and the forms in which they may arise.

Understand there are many forms of hazards which may go unnoticed in a workplace (ergonomic hazards such as the discomfort from a badly designed seat or tool for example), but which, in the long run, may result in unnecessary costs to your operation and human suffering.

What does hazard identification involve?

Hazard identification involves the systematic investigation of all potential hazard sources and the recording of hazards identified. In simple terms, it

means identifying all of the possible ways in which people, and now food products, may be harmed through work-related activities as well as criminal acts.

A coordinated, systematic approach to the process will allow farms with a wide range of plants, chemicals, animals, facilities and potentially hazardous work processes to assess their operations for significant hazards and implement control measures to minimize the hazards risk level.

Using a systematic approach

Agricultural and related operations do not fit neatly in narrow industrial work classifications. No two farm operations are alike. Practices and processes used by one dairy operation may not be used by another dairy operation. The harvest equipment used by one cherry farm may be different from another cherry farm, and, yet another may hand harvest cherries using tall ladders.

The principles and examples set forth in this guide may or may not be applicable to all agricultural settings. You should use the underlying concepts as a guide and those principles and procedures that have the greatest applicability to your own operation can be a model for development of your own hazard identification practice.

UNDERSTANDING HAZARD IDENTIFICATION, RISK ASSESSMENT AND CONTROL

The health and safety of workers depends on the owner/employer and workers working together, with or without a consulting entity such as MIOSHA Consultation, Education and Training Division, Michigan State University Extension, Michigan Farm Bureau or other consulting organizations and agencies, to identify, assess and control hazards.

This does not mean that all parties must be involved in every activity and procedure.

Ideally, your Farm Safety Program should prevent a hazard from causing a problem. The role of hazard identification procedures should be to:

1. Initially identify hazards present on your operation or during work activities off the farm, such as transportation
2. Identify control measures
3. Audit the performance of the Farm Safety Program to help keep it functioning properly.

However, if a serious hazard is discovered at any time, the operation should act immediately to mitigate the hazard's risk immediately.

Use the following steps to identify, assess and control hazards:

- Collect information about hazards and potential hazards
- Assess the risk
- Set priorities
- Communicate information about the hazards and risks
- Develop, select and implement controls and monitor their effectiveness

Implementing Hazard

Identification

Dividing hazard identification into manageable portions

Farming is inherently hazardous and identifying every hazard throughout the farm workplace can be an extremely large and complex job. The first step is to break the job down into 'bite-size chunks.' This can be done by using the following techniques:

1. Break your workplace into work sectors. Sectors can be broad or narrow. For example, you can identify your sectors by production unit (crop, animal, process, season, etc.), or work area (farm shop, dairy parlor, field, orchard, plantation, etc.), or work activity (planting, tillage, harvesting, storage, etc.)
2. Break each sector down into tasks
3. Break these tasks down to activities where needed
4. Develop a list of likely hazards for the work sector
5. Analyze the components and activities of each task to identify the individual hazards present

Developing an inventory of tasks

Once the workplace has been divided logically into work sectors, the next step is to develop an inventory of all of the tasks conducted in the identified sectors.

Examples of types of tasks

The task may be broad in nature such as:

- Transporting material, animals and/or equipment from one location to another
- Soil preparation
- Planting
- Feeding
- Crop protection material application
- Veterinary services
- Cultivation
- Husbandry practices
- Harvest
- Milking

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- Packing, sorting, processing
- Marketing
- Storage
- Shipping
- Maintenance

The task may be specific in nature such as:

- Operating large machinery including tractors, combines, harvesters and forklifts
- Operating power tools or hand tools
- Mixing and loading pesticides
- Use of solvents and cleaners
- Obtaining and transferring biological specimens
- Working inside confined spaces (such as milk tanks, water tanks, silos, grain bins, certain fruit storages and manure lift pump stations)
- Spraying chemicals such as lacquer and pesticides
- Using anhydrous ammonia
- Injection of fertilizer or pesticides into irrigation systems
- Administering veterinary medicines
- Securing cargo and equipment on trucks
- Electrical maintenance
- Vehicle maintenance
- Refrigeration maintenance
- Welding and grinding
- Working in a pen with a bull or with an animal during birth
- Field fueling of vehicles
- Working during thunderstorms

It is also necessary to consider future tasks or situations that involve a change to the existing premises or process, or those which are non-routine such as:

- Open or temporary storage in buildings of grain
- Change in brand or type of equipment used
- Clearing and repair of storm damage
- Installation of new equipment
- Discovery of "meth lab" equipment
- Use of new pesticide or chemical

- Using backup generators

Analyzing tasks

Once the task inventory is completed (or possibly, simultaneously with developing the inventory), each task should be analyzed to prepare for identifying all of the hazards involved with the task or associated activities.

In order to later analyze the risks associated with the identified hazards, a manageable level of detail about the task is needed. This means that some tasks must be broken down further into component elements.

The component elements of a task may include:

- Individual activities
- Substances and materials
- Facilities, tools and equipment involved
- Processes used
- Characteristics of the place or time where and when the task is carried out

An easy method of breaking tasks down into elements is usually to consider how the task is undertaken step by step. You could consider the major elements or you could detail each aspect of each element of a task.

For example, the task of pesticide spraying could involve the major elements of:

1. Determination material(s) to be sprayed
2. Set up equipment and practices to be used
3. Mix/load
4. Apply material(s)
5. Clean equipment
6. Complete recordkeeping

The task elements of pesticide spraying could further be broken down to the activities of each element. Continuing the example:

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1. Determination material(s) to be sprayed
 - a. Review results from pest scouting
 - b. Apply risk/benefit analysis to pest control measures
 - c. Review of pesticide label(s)
 - d. Review of alternative measures
 - e. Selection of control measures
 - f. Determination of application restrictions
 - g. *Identify and secure personal protective equipment
2. Set up equipment and practices to be used
 - a. Determine application equipment and cost of use
 - i. Review product labels
 - ii. Evaluate field conditions
 - b. Service equipment;
 - i. *Don personal protective equipment as required if application equipment is contaminated with pesticides
 - ii. Complete basic service, e.g. fuel, oil, lube, filters, hoses, lights, controls, SMV, PTO
 - iii. Service power unit
 - iv. Calibrate equipment
 - c. *Determine Drift Management Plan requirement
 - d. *Update Central Notification and Site Post as required
3. Mix/load
 - a. *Don personal protective equipment as required
 - i. *Check for damage and cleanliness of personal protective equipment
 - ii. *Complete fit test as required
 - iii. *Check for spill kit materials
 - b. *Determine eyewash requirements and maintain eyewash at mix/load area and on application equipment as required
 - c. Partially fill tank as required
 - d. Determine mix sequence and mix materials
 - e. Use steps, ladder or platform
- and put premix into tank
- f. Fill tank
- g. Secure mix load area
4. Apply material(s)
 - a. *Don personal protective equipment as required
 - b. Travel to application site
 - c. *Check for required Site Posting
 - d. *Check for workers or other personnel in application area
 - e. *Check weather conditions for Drift Management Plan implementation
 - f. Set controls to application levels, begin application
 - g. Monitor controls, nozzles and filters for plugs, and for changing weather conditions
 - i. Clean plugged nozzles
 - (1) *Use proper personal protective equipment
 - (2) Clean or remove contaminated personal protective equipment before reentering cab
 - (3) *Maintain contaminated tools outside cab
 - ii. *Implement Drift Management as necessary for changing application conditions
 - iii. *Stop application if workers or other personnel enter the application area
 - h. Return to equipment fill or storage area
 - i. *Remove, clean and properly store personal protective equipment
5. Clean equipment
 - a. *Don personal protective equipment as required if application equipment is contaminated with pesticides
 - b. Clean nozzles and filters, clean interior/exterior of application equipment
 - c. *Clean and properly store personal protective equipment

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6. *Complete recordkeeping
 - a. Update Central Notification with REI information
 - b. Record Restricted Use Pesticide application information
 - c. Record general application information
 - d. Record use of Drift Management Plans
 - e. Record pesticide inventory changes

*In the example above we have included some, but not all, of the risk control practices required by rules covering pesticide applications.

The preferred method is to write down the tasks as in the example above but group discussions leading to work practice development can also be effective in some cases. After breaking down the task into its component elements, the next stage is to identify the hazards involved.

Identifying the hazards

In undertaking the hazard identification task, there are many different factors to consider; including but not limited to, those related to specific hazards, individual tasks, workplace conditions, particular people involved and unique circumstances.

Considering the people factor

An important factor to consider is the people who may be exposed to risks from hazards, and how any individual characteristics may impact on exposure to the hazard. Gathering this information at the hazard identification stage will assist with later risk assessment efforts. In most cases, those affected will be the people involved in the tasks. But, people, plant material, and livestock both on and off your operation can be affected.

During hazard identification, try to take note of “people issues” such as:

- Any special characteristics which should be taken into account. For example, inexperience, age (young or old), chemical susceptibility/sensitivity and

ergonomic issues (such as height or prior injuries)

- Whether people other than immediate workers could be affected
- How these groups of people could be or are affected by the circumstances surrounding the task, such as normal operation, peak production, environmental factors, maintenance activities and working alone

Aids to hazard identification

There are a number of practices which can be undertaken to aid identification of hazards present in the agricultural workplace. These practices may be conducted simultaneously with other risk management processes such as farm inventory development, planting intentions determination, soil testing and any management business assessment activities.

Practices, which will assist in the hazard identification process, include but are not limited to:

- Completing workplace and facility walkthrough/drive through
- Analyzing available information
- Conducting workplace inspections
- Using checklists

Workplace walkthrough/drive through

- Walking through an area, field or building, which the hazard identification process is targeting, is an essential practice even if the owner, worker, or individual involved is familiar with the area and task.

Observing how work is or will be carried out will reveal valuable clues about the hazards involved. It is important not to rely on how you think the work *should* be done (Standard Operating Procedure (SOP)) but to determine how the work is *actually* done.

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How specific tasks are undertaken under normal workplace practice may vary greatly from what standard operating procedures or work rules provide.

Developing Standard Operating Procedures can assist with business planning activities such as hiring, capital investment, enterprise accounting, as well as reduce the risk of injury.

Analyzing available information

Another important aid to identify hazards is to review as much available information as you can. This may assist in identifying potential hazards from the types of equipment, plants, environment, chemicals, materials and work procedures at your workplace.

Sources of information, which may assist in indicating how hazards have arisen in the past, and are likely to happen again, include:

- Accident, incident and first aid records and reports
- Insurance records
- Facility and equipment maintenance and breakdown records
- Site-specific equipment work procedures documentation (sanitation, transportation, field and animal husbandry practices)
- Industry and operation specific safety and health rules, procedures and policies
- Employee training records and in particular “retraining” or disciplinary records
- Operators’ manuals and equipment instruction booklets, which often provide specific safety procedures and risks associated with a particular task or piece of equipment
- State, national and international extension publications
- Industry and fatality, injury, illness and incident data, workers compensation statistics and guidance material from the Bureau of Labor Statistics, National Institute

of Occupational Safety and Health (NIOSH), Michigan Fatality Assessment and Control Evaluation program (MIFACE), industry organizations, and the Michigan Department of Labor and Economic Growth, Consultation, Education, and Training Division

- MIOSHA, Agricultural, Construction, and General Industry Safety and Health Standards
- Industry consensus standards providing specifications for issues such as design, manufacturing, inspection, testing, use and work methods

While reading and analyzing these resources, take note of hazards, risks, and conditions which may be relevant to your workplace. Developing a list of potential hazards for your type of operation will be valuable as a prompt in identifying actual hazards at your workplace.

Undertaking a workplace inspection

One of the most important aids to hazard identification is the workplace inspection.

This may be conducted as part of, or independently, of the workplace walkthrough.

Inspections can focus on specific tasks, locations, or hazards. Essentially, the inspection should be regarded as a fact-finding mission to detect *potential* hazards. Before undertaking the inspection, it is vital that those assigned to the task recognize the intent of the inspection is to uncover both actual and potential hazards.

While the owner and/or internal staff can complete the inspection, a consultant or other “outside pair of eyes” may provide a more accurate assessment of the potential hazards present on your operation.

It is common to hear statements during farm facility reviews such as; “I’ve walked by that missing auger shield for years and just don’t see it anymore,” or “I would never let a

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worker use that machine.”

Activities undertaken during the inspection may include:

- Taking notes or photographs - in most cases the information gained during the inspection will be used over longer periods of time (months or even years) to develop procedures or alter the practice, equipment or facility
- Interacting with family members, employees, product suppliers/buyers and insurance representatives
- Observing work being done - recognize workers will be more likely to “do it right” during the inspection so look for signs of other work practices - be nice
- Visual inspections of equipment
- Taking measurements and readings (such as noise level readings, SO₂ and CO levels, work platform heights, and electrical readings)
- Taking time lapse photos and/or video

Consideration should be given to the following basic hazard categories:

- Impact (falling/flying/rotating objects)
- Penetration (sharp objects capable of piercing body)
- Compression (roll-over or pinching objects including animal contact and equipment operation)
- Chemical exposure (inhalation, ingestion, skin contact, eye contact or injection)
- Temperature (extreme heat or cold, excessive physical exertion)
- Air contaminants (dust, mold, plant material, animal disease, pesticides, welding gas, silo and manure gas causing skin and lung disorders)
- Light (optical) radiation (retinal and skin burns)
- Noise (over 85dB capable of causing permanent hearing damage)
- Water (potential for drowning or fungal infections caused by prolonged wetness)

- Vibration (ergonomic disorders)
- Electrical (sudden exposure to high voltage, prolonged exposure to low voltage)

Using checklists

Checklists are an invaluable aid in any safety and management procedure. They assist in ensuring that:

- Important issues are not overlooked
- There is consistency if the activity is being undertaken by several different people
- There is a formal record of efforts made (can be used in certain circumstances to minimize penalties and provide for insurance reductions)

To gain maximum benefit, checklists used should be specifically developed for the individual workplace. This will ensure that circumstances unique to that workplace are taken into account.

Examples of basic and agricultural checklists can be obtained beginning in July 2006 at the Safety page of Michigan Farm Bureau at <http://www.michiganfarmbureau.com> as well as many industry and government sources. These may be used as a basis from which a customized checklist can be developed for your operation.

In most diverse agricultural operations these checklists provide a base to build on and should not be deemed to cover all potential hazards you may have.

Ongoing process of hazard identification

Hazard identification does not end with the initial walkthrough, inspection, or investigation. Hazard identification should be regarded as an ongoing, integral part of workplace operations. Hazard identification is required for many General Industry operations, and, while agricultural operations have some qualifications from these requirements, agricultural operations

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are required to perform hazard identification at some level for activities such as:

- Before and during the introduction of pesticides, chemicals, and certain hazardous materials to the workplace
- Before and during any alterations or changes to the use of pesticides, chemicals, and certain hazardous materials
- Where new information on hazards or control measures become available for pesticides, chemicals and certain hazardous materials.

Vertically integrated agricultural operations may be required to develop a hazard monitoring system for certain chemicals, work practices, and food safety practices. These requirements will form part of the monitoring and review element of your safety and preparedness program.

Recording hazard identification data

Once gathered, the hazard identification data should be recorded for farm operations and must be recorded for certain activities performed in conjunction with farming operations so that it can be used for risk assessment activities, hazard elimination, and in determining appropriate control and protection measures. A Hazard Identification Report Form is provided in the Appendix of this section.

In practice, the same form may be used to record the hazard identification information, risk assessment details and details of control measures to be used or practices to be implemented. Many operations combine general management activities with the hazard identification forms.

Collect information

Collect information from sources such as:

- ▶ Workers, family members, supervisors and managers – Workers often know, or suspect,

what hazards exist and where they are located. On-farm family members, regardless of age, can provide valuable risk information from different perspectives. A teenage youth may not recognize his or her own poor work practices but may easily identify questionable practices of others including their parent's issues.

- ▶ Associations – Many Associations provide training and can recommend appropriate publications they have developed as well as state and national Occupational Health and Safety organizations and agencies, the National Safety Council and others.
- ▶ Suppliers and manufacturers – Equipment manuals, users' guides, hazard warnings, pesticide and chemical labels, and material safety data sheets are your primary source of hazard information.
- ▶ Occupational safety and health professionals – Safety professionals such as Certified Safety Professionals (CSP), Associate Safety Professional (ASP), Extension staff, industry consultants and physical engineers (PE) can provide technical advice. The Michigan Department of Labor and Economic Growth, Consultation, Education and Training Division has a library of safety videotapes and publications at <http://www.michigan.gov/cis>
- ▶ Legislation – The statutory requirements and the implementing regulations are an excellent guide to identifying and controlling recognized hazards. Use the Agricultural Standards (see Appendix for one of the standards) as a basis for compliance and refer to the General Industry and Construction Standards to assist in developing a comprehensive safety program.
- ▶ Unions – Although there are few unions representing farm workers in Michigan or the Midwest, many

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unions provide health and safety training and information about hazards to their members and others. It is a very good idea to review these materials as a good indicator of how your type of workplace is perceived by workers and their advocates.

- known and suspected health hazards not already on the list
- Use your five senses

Identifying and assessing health hazards

A health hazard is any agent, situation or condition that can cause an occupational illness. There are five types:

1. Chemical hazards, such as battery acid, fuels, pesticides and solvents
2. Biological hazards, often called "biohazards," such as bacteria, viruses, molds, human and animal fluids
3. Physical agents (energy sources) strong enough to harm the body, such as electric currents, heat, light, vibration, noise and radiation
4. Work design (ergonomic) hazards
5. Workplace stress such as harassment, long hours, and isolated work sites

A health hazard may produce serious and immediate (acute) effects or it may cause long-term (chronic) problems. All or part of the body may be affected. Someone with an occupational illness may not recognize the symptoms immediately. For example, noise-induced hearing loss is often difficult for victims to detect until it is advanced.

How can health hazards be identified?

- Prepare a list of known health hazards in similar workplaces such as brown lung, hearing loss, asthma, sun burn, contact dermatitis, etc.
- Review work practices and processes to identify hazard sources and locations
- Interview workers, family members, supervisors and managers to identify

The Hazard Communication Standard (MIOSHA Part 42, 92 and 430) provides for the identification and listing of chemical hazards in the workplace and the development of a written Hazard Communication program. The standard specifically excludes pesticides having the Agricultural Use Requirements box on the label when used within the label's agricultural use application procedures. These pesticides are covered under the Environmental Protection Agency's Worker Protection Standard (WPS).

When pesticides are used outside of the agricultural label procedures they are covered by the MIOSHA Hazard Communication Standard.

Farm operations must follow the MIOSHA Hazard Communication Standard for agricultural pesticides where non-agricultural workers such as electrical and plumbing contractors may be exposed to pesticides while on the farm.

Knowledge acquired under the Hazard Communication Standard helps employers provide safer workplaces for their employees. When employers have information about the chemicals being used, they can take steps to reduce exposures, substitute less hazardous materials, and establish proper work practices including proper personal protective equipment.

The MIOSHA Part 591. Process Safety Management of Highly Hazardous Chemicals also provides methods for hazard identification practices on the farm. Employers are to perform an initial process hazard analysis (hazard evaluation) on processes covered by this standard. The process hazard analysis shall be appropriate to the complexity of the process and is to identify, evaluate, and control the hazards involved in the process. Employers are to determine and document the priority

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order for conducting process hazard analyses based on a rationale which includes such considerations as extent of the process hazards, number of potentially affected employees, age of the process, and operating history of the process.

These provisions establish the minimum requirements for preventing or minimizing the consequences of catastrophic releases and cover toxic, reactive, flammable, or explosive chemicals above threshold quantities. Examples of threshold quantities include: anhydrous ammonia - 10,000 lbs., chlorine - 1,500 lbs., and nitrogen dioxide - 250 lbs.

Community Right to Know provisions of the Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III of the Emergency Planning and Community Right-to-Know Act (EPCRA) require certain hazard identification and community reporting requirements. (See MIOSHA Right to Know Hazard Communication Compliance Guidance and Michigan State University Extension publication Emergency Planning for the Farm in the Appendix)

Prepare a list of known health hazards in the workplace

As a first step, the employer should prepare a current list of all pesticides, chemical and biological substances, physical agents, as well as lists of work design hazards, food and bio security issues, as well as harassment and other stress problems at the workplace. To prepare or update a list:

1. Check current product labels and material safety data sheets (MSDSs) to identify substances covered under the Hazardous Communication Standard, EPA Worker Protection Standard, SARA Title III, or that present another type of hazard not covered by these standards
2. Each pesticide, chemical and biological substance controlled under the Hazardous Communication Standard or the EPA Worker Protection Standard in the workplace must have

- appropriate container labels
3. Current MSDSs or pesticide labels must be readily available to the workers
4. Look at container labels and MSDSs for specific hazard warnings and symbols (such as the skull and cross bones, National Fire Prevention Association markings, food or feed restrictions, and environmental warnings)
5. Determine other products of concern to worker's health such as dust, mold, or plant materials created or disturbed during farming operations that are not covered by supplier or industry based MSDS (there are industry bases MSDS for certain feed dusts)
6. Conduct inspections to identify equipment defects, such as material containers and pipes that are not properly labeled or leak, guards and shields, open, damaged or improperly used electrical equipment
7. Slip and fall issues, elevated work surfaces
8. Review inspection and accident reports, complaint files, shop plans, first aid records, product literature and other internal documents
9. Monitor the workplace as applicable (measuring noise, temperatures, concentrations of airborne chemicals and dust, etc)

Review work practices and processes

Floor plans, facility and farm maps may show for example, that certain points in the production process release chemicals or other contaminants such as dusts into the air or work area. Sloping land, for example, may allow for rain or irrigation activities to cause minor flooding of work areas and electrical control facilities.

Also check maps for emergency response access points (areas where rescue vehicles can regularly gain access) and location labeling to be used to direct first responders to an accident site.

Check for work design problems that may cause back injury, hearing loss, and

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other ergonomic hazards. Look for the work tasks associated with accidents, complaints and ill health in each area.

Interview workers, supervisors and managers

Interview workers, supervisors and managers during inspections. Ask them what hazards they work with and what work-related health problems they know about. Remember to deal with the concerns of workers at any time they are raised, not just during inspections.

Talk to vendors and suppliers if you need more information about a specific product, tool, or piece of equipment.

Use your five senses

Some substances and physical agents can be detected with your five senses. For example, dusts and fumes sometimes form a haze. Vibration and temperature can be felt. An abnormal taste may be a sign of airborne chemicals. Some substances have a distinct color, visual appearance or odor.

Odor is a common warning property. Be careful to check the substance's odor threshold in the *Physical Properties* section of its MSDS. Only use odor to detect a substance if it can be smelled at levels below hazardous concentrations.

Unfortunately, many hazardous agents and conditions cannot be detected with the senses such as carbon monoxide (CO). Others, such as hydrogen sulfide (H₂S) gas, are often dangerous when strong enough to be detected by smell. Using your senses is not always a safe way of detecting hazards.

Quick health hazard identification checklist.

- What chemical substances are produced, used, handled, stored or shipped in the workplace?**
- Are any vapors, gases, dusts, mists or fumes present (including chemical by-products of work processes)?**
- Are biological substances (such as bacteria, viruses, parasites, dusts,**

molds and fungi) present in the workplace, the ventilation systems and other components of the physical plant or work area?

- Are physical agents (energy sources strong enough to harm the body, such as electric currents, heat, light, vibration, noise and radiation) present?**
- Are temperature extremes present?**
- Do ergonomic hazards exist—such as work requiring lifting, awkward posture, repetitive motions, excessive muscular force or computer use?**
- Could any work processes, tools or equipment cause health hazards (such as back injuries, soft tissue injuries, whole body vibration, hearing loss, infections and so forth)?**
- Could departures from safe work practices cause illnesses?**
- Can any potential health hazards be detected with the senses (smell, taste, touch, hearing and sight)?**
- Is harassment present in the workplace?**
- Are there any complaints from workers about workplace related health problems?**

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How can health hazards be assessed?

Once a health hazard is identified, the risk it poses to workers must be assessed. Suppliers and consultants can help the employer do this by using monitoring equipment to assess exposure levels and by determining the probability and severity of any potential exposure.

There are many different monitors for detecting and assessing health hazards. Some, such as air monitors, sample the work environment at specific places for specific chemical hazards or can be worn to establish Time Weighted Average (TWA) exposure levels.

Determine if the level exceeds the MIOSHA standard for Maximum Allowable Concentrations (MAC) under MIOSHA Part 700 Agriculture 9 (see Appendix). Other monitors measure the levels of noise, vibration and so on. Advice on how to interpret monitoring results can be obtained from equipment suppliers, consultants and government agencies.

Chemical hazards

If possible, use monitoring equipment to determine exactly what the exposure levels for health hazards are in the workplace and at workstations. For pesticide applications, the product label specifies Restricted Entry Intervals (REI). The REI is designed to reduce the risk to workers doing hand labor tasks in treated areas to acceptable levels.

Different hazards, such as animal health care products and stray voltage, require different monitoring techniques and equipment. The employer may decide to bring in experts to do the monitoring.

Once an exposure level is determined, compare it with standards set by the organization, industry, or government standard or industry consensus standards. Review MSDSs as well as industry and product literature for advice. (See Part 700 Agriculture in the Appendix to this section

for the regulations relating to chemical Maximum Allowable Concentration (MAC) limits).

Biological hazards

Some biological hazards can be detected by monitoring. However, the risk of catching an illness can usually be assessed by applying knowledge of the disease involved, including how it spreads and infects people or livestock.

Biological safety data sheets provide useful information such as survival characteristics of the microorganism outside of the body, how it is transmitted and how likely workers are to contract the disease. The Public Health Agency of Canada maintains a listing biological hazards with MSDS assessments of those hazards at <http://www.phac-aspc.gc.ca/msds-ftss/>

Illness, such as asthma, can be caused by chemical, biological, and physical hazards. Asthma caused by agricultural activities is on the rise. Many resources are available on the internet.

Physical health hazards

Physical health hazards are sources of energy strong enough to cause harm. They include noise, vibration, heat or cold and radiation.

Noise – Common noise sources include equipment, animals, work processes, compressors, ventilation systems and power tools. Generally, if ordinary conversation cannot be understood at normal distances, noise levels are too loud. Hazard identification techniques, such as inspections, monitoring and conversations with workers will usually detect noise concerns.

Vibration – Vibration is a rapid *back and forth* or *up and down* motion that may affect all or part of the body. It can gradually damage nerves and circulation

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systems in limbs and affect internal organs. Standard hazard identification techniques can detect what jobs expose workers to vibration. Monitoring and assessing vibration usually requires technical specialists, but, if your hands or feet become numb when using a piece of equipment you likely are being subjected to substantial vibration.

Heat and cold – The health effects of too much heat include heat cramps, heat exhaustion and heat stroke. Cold can produce frostbite and hypothermia. As well as causing serious health problems, heat and cold stress disorders can reduce performance and increase the risk of accidents.

Agricultural regulations require the employer assure heat stress is monitored where workers use personal protective equipment and to provide adequate drinking water for field tasks. Review indoor and outdoor conditions and inform workers what measures can be used by them to protect themselves from heat and cold stress disorders. Consider temperature/humidity maximum and minimum levels where operations will stop or where special precautions will be taken.

Radiation – Radiation is made up of moving particles or waves of energy. It is divided into two groups: (1) *ionizing radiation*; and (2) *Non-ionizing radiation*.

Ionizing radiation is given off by decaying radioactive elements, such as uranium. Specialized monitoring equipment is used to measure and assess radiation exposures. Radiation workers are also required to wear badges that measure the radiation dose they receive.

Non-ionizing radiation includes:

- Ultraviolet radiation given off by sun lamps and welding equipment and can burn the skin and cause eye damage
- Infrared radiation (radiated heat) used in cooking and warming equipment in food processing and

- industrial packaging
- Lasers producing concentrated beams of light, used in a variety of commercial, medical, industrial purposes and now agricultural procedures, must be properly set up and adequately shielded to prevent damage to the eyes or skin of workers
- Microwave and high radio frequency radiation used in cooking equipment, radar as well as in high-energy radio transmission and communications equipment, if not properly shielded, some equipment may injure the skin, eyes and other organs
- Long wave radiation used in radio and other communications equipment can heat the entire body

Assessment of radiation hazards is often a specialized area. If there are radiation sources on your operation, such as extensive welding, seek information from equipment suppliers to identify risks to determine suitable worker protections. Remember, a welding helmet with a single lense grade will not protect your eyes from different types of welding processes.

Physical demands (ergonomic hazards)

Hazards can exist in the design of the workplace, the workstation, tools and equipment and the workflow. Ergonomics is concerned with identifying and controlling these hazards by reducing the physical, environmental and mental stresses associated with a job. It does this by trying to balance the capabilities of the worker with the demands of the job. Ideally, the job should fit the person's mental, physical and psychological characteristics.

Common problems caused by work design hazards include repetitive strain injuries (RSIs), cumulative trauma disorders (CTDs) and musculoskeletal injuries (MSIs), including back injuries. Ergonomic-related injuries are the fastest growing occupational health problem.

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Examine these factors when assessing the risk of ergonomic hazards:

1. The posture a worker must use to do the job (stooping, bending and crouching)
 - a. For example, in a static posture, such as when sitting or standing without a break, the muscles are held in a fixed position without movement
 - b. Over time, work requiring a static posture can cause health problems such as complaints of back, shoulder and neck pain can indicate static posture problems
2. The muscular force (exertion) required (lifting, pulling, pushing, and twisting)
 - a. Muscular force describes the amount of force required to do the work; consider the weight of the loads or tools involved; the fit of handgrips to the worker and the force required; the muscles used; and the adequacy of work gloves
 - b. Poorly shaped, heavy or vibrating hand tools can encourage workers to grip the tool too hard, reducing blood flow to muscles and increasing fatigue, bulky or clumsy gloves can do the same thing
3. The number of repetitive motions needed (frequency, speed, duration and position)
 - a. Doing the same job rapidly over and over again can cause injury
 - b. Jobs that must be repeated in less than 30 seconds, such as setting transplants, are classed as highly repetitive
 - c. Lack of work variation during shifts can prevent workers from being able to rest their muscles adequately
4. The physical condition of the person doing the job
5. Vibration of all or part of the body such as when using chainsaws, operating certain harvesting

equipment, or using certain sorting equipment

6. Work organization factors such as where, when and how the work is done and at what pace
 - a. Poorly designed tasks can force workers to do too much too fast can increase stress and reduce work efficiency, increase the risk of accidents, and decrease productivity
7. Work environment problems including vibration, heat, cold and contaminants in the atmosphere

Remember that these factors can interact with each other or with other safety hazards, worsening the situation. A good rule of thumb is: The more awkward or static the posture required by a job; the more excessive the force needed to do the work; and the more repetitive the tasks, then the greater will be the risk of injury.

Stress hazards

A newer form of workplace illness is caused by stresses in the workplace such as harassment and varying start shiftwork.

Workplace harassment – Harassment may seriously harm the health and well being of victims. It can also interfere with efficiency and productivity. Employers should consider establishing and implementing a policy to protect workers.

To assess the risk of harassment, the employer can:

- Check to ensure the harassment policy has been implemented
- Check for signs the policy is not taken seriously
- Look for and respond to complaints or concerns from workers

Shiftwork – Shiftworkers have irregular patterns of eating, sleeping, working and socializing that may lead to health and

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social problems. Shiftwork can also reduce performance and attentiveness. In turn, this may increase the risk of accidents and injuries. Similar concerns occur during the long hours of planting and harvesting. The employer and workers can work together to identify and control these hazards.

Cooperation is essential to:

1. Assess the risks to the worker's health and safety posed by the work; and
2. Inform the worker about the nature and extent of the risks and how to eliminate or reduce them

Employers should be sensitive to stress caused by such things as workload, the pace of work and so forth.

Identifying and assessing safety hazards

A safety hazard is anything that could cause an injury. Unlike the harm caused by many occupational illnesses, an injury caused by a safety hazard (such as a cut or fracture) is usually obvious. Safety hazards cause harm when workplace controls are not adequate. Some examples of agricultural safety hazards include:

- Slipping/tripping hazards (such as electrical cords across floors)
- Uneven work surfaces
- Fire and explosion hazards
- Moving parts of machinery, tools and equipment (such as pinch and nip points)
- Large equipment hookup
- By-pass starting of tractors
- Work at height (such as work done on scaffolds or ladders)
- Ejection of material (such as from grinding operations)
- Pressure systems (such as steam boilers and pipes, hydraulic systems)
- material transport systems (such as auger and elevators)
- Fueling equipment
- Electrical system failures

- Contact with elevated or buried utilities (gas and electric lines)
- Vehicles (such as forklifts and trucks)
- Lifting and other manual handling operations
- Materials falling from height, rolling, shifting or caving-in
- Unsafe use of explosives
- Violence
- Hazards posed by working alone or in isolated workplaces

Standard identification methods can be used on safety hazards. In addition, you can complete a job safety analysis (JSA) performed on each dangerous job. A JSA involves breaking down each job into its steps and analyzing the hazards present at each step. Product literature, industry publications and regulations are useful starting points for developing JSAs. Many health and safety publications contain examples of various formats for JSA forms as well as detailed instructions on how to perform a JSA. See www.michigan.gov/cet for MIOSHA's Job Safety Analysis booklet that explains what a job safety analysis is and contains guidelines for conducting your own step-by-step analysis.

Hazard Identification Procedures

UNDERSTANDING RISK ASSESSMENT

What is probability?

Probability is the chance that a hazard will cause harm. In safety risk management systems, probability is often categorized as:

- ◆ Frequent (workers are frequently at risk)
- ◆ Probable (the hazard is likely to cause harm)
- ◆ Occasional (workers are occasionally at risk)
- ◆ Remote (the hazard could cause harm, but is very unlikely to do so)
- ◆ Improbable (the hazard is unlikely to ever cause harm)

Other systems provide similar discussions. The probability or likelihood of an accident occurring is evaluated, the potential consequences are calculated or estimated, and based on these two factors, the risks are assigned priority for risk control through the use of a risk rating.

Rating systems, such as the CARVER system, can be used to assist operations to identify critical areas where resources and time are better spent.

The CARVER scoring methodology is commonly used by the Department of Homeland Security to assess critical preparedness issues.

Each letter of the CARVER evaluation model stands for one component; Criticality, Accessibility, Recuperability, Vulnerability, Effect, and Recognizability. The letter S is added for Shock where the model is used for terrorist or food security risk modeling. This evaluation is normally represented in table form. The table has a number of rows, each row being labeled with one “node” (i.e. task, activity, step or component).

In order to undertake risk assessment, it

is first necessary to understand the nature of risk.

What is severity?

Severity is the seriousness of the harm that could result from contact with a hazard. It is described as:

- ◆ Catastrophic (death and/or severe destruction)
- ◆ Critical (serious injury and/or property damage)
- ◆ Marginal (minor injury and/or property damage)
- ◆ Negligible (no injury and/or property damage)

Note: We are focusing on injury and property damage. You can add food safety, bio security, environment impact, market impact or any other risk category to the model as necessary.

What is a risk?

Risk describes the odds that a hazard will cause harm. It refers to the probability and severity of potential accidents and dangerous occurrences (and so called “near misses”). Risk management is a technique used to identify and control risk caused by hazards.

What is risk analysis?

The combination of identifying hazards and assessing their risk is called risk analysis. Risk analysis can help the farm owner and employer to set priorities. Risk is calculated by using the formula:

$$\text{Risk} = \text{Probability} \times \text{Severity}$$

Several systems assign mathematical values to probability and severity to help calculate risk ratios for hazards. Normally, hazards with the highest risk that affect the most workers, property, or food safety should receive the greatest attention.

Assess the risk

Hazard Identification Procedures

Once a hazard is identified, determine its probability and severity. Assessment may involve some research and monitoring of actual work activities.

For example, you determine noise is a potential hazard on a large tractor. The next step would be to use monitoring techniques or equipment (noise meter/noise dosimeter) to find out how loud the noise is, where and when the noise is a problem, how long the noise is at an unacceptable level, and so on.

Look for any factors that could contribute to the hazard. For example, consider work processes, work area design, existing hazard controls, and related training procedures. In the case of the tractor noise hazard, the problem may be made worse by such things as metal on metal contact, equipment vibration, lack of insulation, loose or damaged mounts, operating in animal facility enclosures, improper control settings, worn out mufflers etc.

Assess the risk posed by each hazard. Ask these questions:

- ◆ How likely is the hazard to cause harm?
- ◆ Under what conditions is harm likely to occur?
- ◆ How quickly could an unsafe condition arise?
- ◆ What type of harm is involved?
- ◆ How many workers could be hurt?
- ◆ Is there a history of problems, accidents or dangerous occurrences resulting from this hazard?
- ◆ What monitoring is needed to evaluate the risk?
- ◆ What is the severity?

Set priorities

Priorities can be set by using the formula (Risk = Probability x Severity). Factors such as the limits of technology, fiscal resources and potential problems raised by hazard controls will have to be considered. The following table illustrates

one way of assigning probability and severity values. Adapt it to suit your needs.

Hazard Identification Procedures

Hazard Priority Chart for Jack and Jill's Workplace		
<p>Probability factors are ranked in order of importance below:</p> <ul style="list-style-type: none"> ➤ Frequent (workers are frequently at risk) ➤ Probable (hazard is likely to cause harm) ➤ Occasional (workers are occasionally at risk) ➤ Remote (the hazard could cause harm, but is very unlikely to do so) ➤ Improbable (the hazard is unlikely to ever cause harm) 	<p>Severity factors are ranked in order of importance below:</p> <ul style="list-style-type: none"> ➤ Catastrophic (death or severe destruction) ➤ Critical (serious injury or property damage) ➤ Marginal (minor injury or property damage) ➤ Negligible (no injury or property damage) 	<p>Risk of harm = Probability X Severity</p> <p>Set priorities by comparing probability and severity.</p>

Items	Hazard	Probability	Severity	Overall Priority	Consequences
1	Cutting up scrapped bulk gasoline tanks that may contain explosive vapors.	Frequent	Catastrophic	First (Highest)	Work done frequently due to tank replacement drive undertaken by gas stations for environmental reasons. This presents a fire and explosion hazard that could cause serious injury to workers and destroy our workplace.
2	Guard on metal shearing press is malfunctioning on every shift.	Probable	Critical	Second	Press used during each shift. Fingers of operators can be placed in the danger zone when the guard malfunctions. Fingers could be amputated. Accident probable due to hours of exposure to hazard.
3	Improper disposal container for used needles in medical rooms.	Occasional	Critical	Third	Container handled occasionally. Staff nurse and two emergency medical technicians could receive puncture wounds and serious infections if condition is allowed to persist.
4	Staff moving office furniture and filing cabinets.	Remote	Marginal	Fourth	Rarely happens. Safety officer sprained her wrist last month while moving a filing cabinet. Movers to be hired next time.
5	Water supply stored in large underground tank outside of workplace.	Improbable	Negligible	Fifth (lowest)	Tank serviced by a contractor. Our workers never work in or near the tank. Tank will drain into a sewer if ruptured.

Hazard Identification Procedures

Communicate information

Workers and family members must know about the hazards in the workplace in order to protect themselves and guests coming on to the farm. Communicating hazard information and protective controls and practices to workers is one of the most important functions of this program. To do this, you can:

- Post information such as: warning signs; hazard labels; hazard identification summaries; the results of inspections; summaries of workplace monitoring; and incident investigations
- Provide health and safety information to all supervisors/workers
- Discuss hazards with workers, family members, supervisors and managers
- Hold meetings to discuss hazard issues
- Develop or arrange worker training and education
- Keep containers for pesticides, chemicals and biological substances properly labeled
- Keep material safety data sheets (MSDSs) and pesticide label files current
- Establish and maintain a Central Notification location that is readily available to workers during their entire work shift
- Keep workers who raise safety and preparedness concerns informed about the status of the investigation

1. It must adequately prevent the hazard from causing harm
2. It must protect everyone who could be harmed by the hazard
3. It must not create new hazards, or production and quality control problems (if it does, employees may be tempted to subvert it).
4. It must not create a hazard to the environment or public outside of the workplace

Develop, select and implement controls

Risk assessment is meaningless unless effective controls are developed and put in place. Control means eliminating the hazard or reducing its risk of harm to an acceptably safe level. An effective control must meet four standards:

FOOD ESTABLISHMENT

Hazard Identification Procedures

OPERATIONS:

Management

Many farm operations are vertically integrated where they perform tasks such as storage, packing and/or processing. Even if they don't perform these tasks they are being asked or required by the buyer of their products to develop and implement a food safety/security program.

Commercial businesses and some farm operations working with food are called "food establishments". Generally, these are establishments that work with food products that will directly enter the consumer products level. Any food handler working with fresh produce can be a food establishment for Food and Drug Administration (FDA) purposes.

FDA recommends that food establishment operators consider:

- Preparing for the possibility of tampering or other malicious, criminal, or terrorist actions
- Assigning responsibility for security to knowledgeable individual(s)
- Conducting an initial assessment of food security procedures and operations, which we recommend be kept confidential
- Having a security management strategy to prepare for and respond to tampering and other malicious, criminal, or terrorist actions, both threats and actual events, including identifying, segregating and securing affected product
- Planning for emergency evacuation, including preventing security breaches during evacuation
- Maintaining any floor or flow plan in a secure, off-site location
- Becoming familiar with the emergency response system in the community
- Making management aware of 24-hour contact information for local, state, and federal police/fire/rescue/health/homeland security agencies

- Making staff aware of who in management they should alert about potential food safety or security problems (24-hour contacts)
- Promoting food security awareness to encourage all staff to be alert to any signs of tampering or other malicious, criminal, or terrorist actions or areas that may be vulnerable to such actions, and reporting any findings to identified management (for example, providing training, instituting a system of rewards, building food safety and security into job performance standards)
- Having an internal communication system to inform and update staff about relevant security issues
- Having a strategy for communicating with the public (for example, identifying a media spokesperson, preparing generic press statements and background information, and coordinating press statements with appropriate authorities)

Supervision

- Providing an appropriate level of supervision to all staff, including cleaning and maintenance staff, contract workers, data entry and computer support staff, and especially, new staff
- Conducting routine security checks of the premises, including automated manufacturing lines, utilities and critical computer data systems (at a frequency appropriate to the operation) for signs of tampering or malicious, criminal, or terrorist actions or areas that may be vulnerable to such actions

Recall Strategy

- Identifying the person responsible, and a backup person
- Providing for proper handling and disposition of recalled product

Hazard Identification Procedures

- Identifying customer contacts, addresses and phone numbers

Investigation of suspicious activity

- Investigating threats or information about signs of tampering or other malicious, criminal, or terrorist actions
- Alerting appropriate law enforcement and public health authorities about any threats of or suspected tampering or other malicious, criminal, or terrorist actions

Evaluation program

- Evaluating the lessons learned from past tampering or other malicious, criminal, or terrorist actions and threats
- Reviewing and verifying, at least annually, the effectiveness of the security management program (for example, using knowledgeable in-house or third party staff to conduct tampering or other malicious, criminal, or terrorist action exercises and mock recalls and to challenge computer security systems), revising the program accordingly, and keeping this information confidential
- Performing random food security inspections of all appropriate areas of the facility (including receiving and warehousing, where applicable) using knowledgeable in-house or third party staff, and keeping this information confidential
- Verifying that security contractors are doing an appropriate job, when applicable

Hazard Identification Procedures

Appendix - Hazard Identification Procedures

Hazard Identification Report Form

Part 700 - Agriculture

MIOSHA - Right to Know Hazard Communication Compliance Guide

Emergency Planning for the Farm

Hazard Identification Report Form

Hazard Identification Record					
Work Task:		Date Prepared:		Signed:	
Work Type/Location	Task/Activity/Work Process	Hazard	People/Product/Facility at Risk	Current Controls (if any)	Comments

Comments:

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