NAMI
Safe Equipment Design Checklist

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Lists

- Grocery List
- Honey-Do List
- Wish List
- Bucket List
- Naughty / Nice

What is a checklist?

check·list

/ˈCHekˌlist/

noun

a list of items required, things to be done, or points to be considered, used as a reminder.

EHS Definition

- Things I need to remember to check so that I can protect my employees or make sure a safe condition is present

New Equipment

- Cost
- Design (what is it going to do for us)
- Serviceability (parts, access)
- Space Requirements
- Utilities

New Equipment

BUT WHAT ABOUT SAFETY?

- Make sure Plant Engineering/Maintenance and Safety are engaged in the needs and design phase on the front of the project

NAMI Safe Equipment Design Checklist

- Developed by NAMI Safety Committee

- The purpose of this checklist is to eliminate hazards to employees who operate, maintain and sanitize equipment. (The focus of these design guidelines is on employee safety). The Safe Equipment Design Checklist is intended to work in concert with the NAMI Sanitary Equipment Design Checklist.

- The North American Meat Institute has developed the Safe Equipment Design Checklist to identify the basic principles of safe equipment design for food manufacturing equipment. Using this tool will assist designers in identifying problem areas and typical design flaws that create hazards to operations, maintenance and sanitation employees.

NAMI Safe Equipment Design Checklist

REFERENCES:

ANSI Standards - American National Standards Institute

National Chicken Council & National Turkey Federation Pre-Purchase Checklist

NFPA Standards - National Fire Protection Association

OSHA 1910 Occupational Health & Safety Standards for General Industry

NAMI Safe Equipment Design Checklist

When or how do you use the checklist?

- When new equipment comes to your facility

REACTIONARY

- You give your equipment supplier the checklist to aid them in designing a piece of equipment for your needs

PROACTIVE

NAMI Safe Equipment Design Checklist

The checklist is broken down into 10 principles:

1. Equipment Guarding
2. Design and Engineering
3. Energy Control
4. Ergonomics
5. Training

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6. Ingress / Egress
7. Hazard Communication
8. Confined Spaces and Hazardous Locations
9. Fall Protection
10. Process Safety Management

NAMI Safe Equipment Design Checklist

NORTH AMERICAN MEAT INSTITUTE

Safe Equipment Design Checklist

Review Date: _____

Location: _____

S	U	NA	Comments

NAMI Safe Equipment Design Checklist

Ratings

- Satisfactory: Design is acceptable and is safe for employees working with the equipment
- Unsatisfactory: Design is unacceptable and is not safe for employees working with the equipment
- Not Applicable (N/A): Requirement does not apply to the equipment

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Principle #1 – Equipment Guarding

Reference - OSHA Title 29, CFR Part 1910 Subpart O (principally 1910.212, .217 & .219) and Subpart I

Subpart O - Machinery and Machine Guarding

Subpart I - Personal Protective Equipment

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1.1	New equipment has all guards & warning labels supplied or offered by the manufacturer.
1.2	Where possible, all point of operation hazards have been eliminated or other safeguards have been implemented.
1.3	Any exposed hazards such as belts and pulleys, chain and sprocket, rotating motor shafts and shackle line wheels below seven feet are guarded on all sides (top, bottom, front, back, etc.). If these areas above seven feet are routinely accessed with ladders, stairways or catwalks for maintenance or santiation, exposed hazards are fullly guarded.
1.4	Guards are built of substantial material suitable to withstand the environment in which they will be used.
1.5	Any guarding with a pivot-point or hinge that is a wire or pin is substantial enough for frequent opening & closing and the pivot-point or hinge weld is substantial.

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1.6	Guards have stops to prevent over-tightening and are guards of proper fit and size.
1.7	Safety interlocks are in place where applicable and cannot be easily overridden. Safety interlocks will shut the machine down in the emergency stop mode though they are not a substitute for lockout/tagout.
1.8	All shaft ends are covered with a non-rotating cap or cut down to a length of less than ½ the diameter of the shaft and made smooth. If the shaft is keyed, the key stock will not extend past the end of the shaft.
1.9	Direct-drive electric motors are used to eliminate chain and sprocket, belt and pulley, and other similar guarding situations if applicable.
1.10	Minor machine adjustments such as adjusting air pressure, paddle adjustment, etc. are made outside the point of operation or guarded areas.
1.11	The equipment can be lubricated without removing the safeguards.
1.12	Equipment with moving parts requiring visual inspection while in operation has guards designed to allow for inspection without removal of the guards.
1.13	A PPE evaluation will be performed and appropriate PPE secured before equipment installation.

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Principle #2 - Design and Engineering

Reference - OSHA Title 29, CFR Part 1910. All subparts as applicable to equipment design. Also, appropriate concensus standards (e.g. ANSI) and in particular, NFPA 70 National Electric Code.

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2.1	The equipment has adequate attachment/lifting points, clearances, etc. readily noted for installation.
2.2	Equipment controls are accessible, clearly labeled, and easy to understand (up, down, stop, start, etc.).
2.3	Emergency stops (e.g. pull cords, mushroom switches, etc.) are located on all machines or sections where operators normally perform work.
2.4	Emergency stop switches/devices are UL rated Category 3 (or higher).
2.5	Emergency stops with "pullout auto restart" capability are prohibited.

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2.6	Sharp edges, burrs, and rough surfaces have been removed or guarded.
2.7	Equipment has the appropriate ratings/listings for the environment in which it will be installed.
2.8	The manufacturer has provided maintenance manuals (including preventive maintenance intervals), operating manuals and schematics.
2.9	Equipment is designed and will be installed at the lowest noise level feasible (e.g. mufflers for pneumatic exhausts, shielding, etc.).
2.10	Labels and signage will be designed to be washdown damage resistant (e.g. voltage labels, danger signs, etc.).

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2.11	All electrical connections are designed to be finger safe or recessed (< 12.5mm), per IEC 60529.
2.12	To minimize the arc flash incident energy level, electrical panels or disconnects are equipped with RK-1 fuse technology.
2.13	Stairs, ladders, railings, guardrails, platforms, etc. are designed in accordance with OSHA regulations for sizes, incline angles, loads, clearances, etc. as a minimum, and per local building codes when required.
2.14	Electrical control panels and electrical conduit are designed and installed to prevent water or moisture collection.
2.15	Direction of flow arrows should be placed on piping and tubing at appropriate locations when flow is in one direction only.

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Principle #3 - Energy Control

Reference - OSHA Title 29, CFR Part 1910.147

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3.1	The equipment has highly visible isolation devices for lockout/tagout of all energy sources (e.g. electrical, hydraulic, pneumatic, etc.).
3.2	Equipment has lockout/tagout capability that is easily accessible on/at the equipment usage area.
3.3	A visible gauge has been installed to ensure automatic pneumatic dump valves work properly during lockout/tagout.
3.4	Appropriate on/off controls allow for testing or checking for power after energy isolation devices have been applied (e.g. disconnects with no on/off buttons, touch screens with soft keys only, etc.).
3.5	Where necessary, safety blocks or other devices are provided for securing mechanical or gravitational energy sources.
3.6	All energy sources are specifically listed, with lockout/tagout capability illustrated, in the O&M manual provided by the manufacturer/distributor.
3.7	Where applicable, multiple energy sources are provided with separate means of disconnect/isolation when it is necessary to keep other components energized while servicing (e.g. control panel, gluing systems, etc.).

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Principle #4 - Ergonomics

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4.1	Ergonomic issues have been addressed in the equipment's design.
4.2	Equipment will be designed to minimize ergonomic hazards or the need for further ergonomic equipment (long reach/high reach, heavy lifting, bending, etc.).
4.3	Equipment workstations are adjustable to accommodate the anthropometric human range of the 5th percentile female (approximately 60" tall) to the 95th percentile male (approximately 74" tall).
4.4	Equipment servicing requirements and equipment changeovers (including tooling) do not add ergonomic hazards (e.g. excessive lifting for loading, disassembly, cleaning, replacement of stock rolls, etc.).
4.5	Conveyers are designed to allow employees who must remove product from a belt to have finger or thumb strain relief (e.g. string belt versus a flat belt).

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Principle #5 - Training

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5.1	Standard Operating Procedures or an O&M Manual has been supplied and/or developed for normal operations, servicing and maintenance to include appropriate safety precautions.
5.2	As applicable, the equipment supplier will provide equipment use/safety training (maintenance procedures, operating procedures, etc.) to end user employees before start-up.

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Principle #6 - Ingress/Egress

Reference - OSHA Title 29, CFR Part 1910. All subparts as applicable to equipment design. Also, appropriate concensus standards (e.g. ANSI) and in particular, NFPA 101 Life Safety Code.

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6.1	A minimum aisle width of 28 inches with a height of 80 inches can be provided around the equipment. Aisle width design must take into account obstacles such as stands, tables, pallets, augers, etc.
6.2	Evacuation routes around equipment and procedures can be changed if necessary.

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Principle #7 - Hazard Communication

Reference - OSHA Title 29, CFR Part 1910.1200 and Part 1910.94.

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7.1	An SDS can be secured and Hazcom training completed before equipment operation begins if a new chemical will be used or produced.
7.2	New chemicals have been reviewed and approved by the appropriate personnel (e.g. safety, environmental, food safety, etc.).
7.3	Chemical tanks used in conjunction with equipment (e.g. glue pots, oilers, etc.) are sealed/enclosed and labeled to prevent employee exposure.
7.4	Ventilation for hazardous vapors/gasses/fumes which may be produced at the site of the new equipment will be provided before start-up if needed.
7.5	Hazardous chemicals used in conjunction with equipment shall be selected to reduce the hazards of exposure to employees who operate the equipment.

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Principle #8 - Confined Spaces and Hazardous Locations

Reference - OSHA Title 29, CFR Part 1910.146

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8.1	Required evaluation will be performed, permitting set up, etc. before operation begins if the new equipment creates a hazardous location or confined space.
8.2	All attempts have been made to reduce the need for permit required confined space entry.
8.3	Signs are provided on all permit required confined space entry access points.

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Principle #9 - Fall Protection

Reference - OSHA Title 29, CFR Part 1910 and 1926. All subparts as applicable.

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9.1	Platforms and other access points will be adequate to minimize falls including nonslip material.
9.2	Widths of ladders and platforms on the equipment are at least 22 inches.
9.3	Platforms 4 feet or more above any walking or working surface require railings 42 inches in height with a midrail at 21 inches and a 4 inch toeboard.
9.4	Where fall exposures exceeding four feet exist (that cannot be guarded with standard railings), equipment is provided with pre-engineered anchorage points (5,000 pound minimum rating) for fall protection attachments. This includes for activities such as maintenance and sanitation.
9.5	Guardrails are required on all stairs of 4 risers or higher.
9.6	Equipment work stands/areas create no fall protection hazards, or include appropriate, OSHA compliant fall protection/guarding.

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Principle #10 - Process Safety Management

Reference - OSHA Title 29, CFR Part 1910.119

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10.1	A determination will be made prior to installation whether or not the equipment will be operated under a PSM program.
10.2	PSM related requirements or provisions are fully presented in the O&M Manual.

NAMI Safe Equipment Design Checklist

A key to getting equipment manufacturer cooperation up front is to make sure that they are aware of your requirements

One way to do this is to have an agreement in the purchase contract

NAMI Safe Equipment Design Checklist Agreement

(Revised 03/16sl,aq,tt)

Land O'Frost requires that all equipment or machinery purchased or brought into the facility on a trial or test basis for production, maintenance or research and development meet the requirements of the North American Meat Institute (NAMI) Safe Equipment Design Checklist. By signing this agreement, you understand and agree that equipment or machinery must meet the applicable checklist elements prior to operating the equipment. The checklist can be downloaded directly from the NAMI Worker Safety website.

http://www.workersafety.org/

It is your responsibility to ensure the applicable requirements of the checklist are met before shipping the equipment or machinery; however and LOF EHS Manager and Maintenance Manager will review the equipment or machinery prior to start-up to ensure that all applicable requirements are met.

Vendor Name: _____
(Print)

Phone #: _____

Vendor Representative: _____ Date: _____
(Print)

_____
(Sign)

EXAMPLE

NAMI Safe Equipment Design Checklist

- Let Vendors know requirements/expectations early in a project using the NAMI Safe Equipment Design Checklist

- Verify equipment once it arrives at the facility using the NAMI Safe Equipment Design Checklist

NAMI Safe Equipment Design Checklist

The NAMI Safe Equipment Design Checklist can be found at:

http://www.workersafety.org/

More Information

- Sanitary Equipment Design Checklist – www.meatinstitute.org

Questions?