		Number: EA CRAD EA-32-12 Revision: 0 Effective Date: December 23, 2022
Material Handling Safety Criteria and Review Approach Document		
Authorization and Approval	David Olah Digitally signed by David Olah Date: 2022.12.23 10:42:25 -05'00' for Kimberly G. Nelson, Director Office of Worker Safety and Health Assessments	Nimalan Mahimaidoss Digitally signed by Nimalan Mahimaidoss Date: 2022.12.23 10:36:32 -05'00' Nimalan Mahimaidoss, Lead Safety Engineer Office of Worker Safety and Health Assessments

1.0 PURPOSE

The mission of the U.S. Department of Energy (DOE) Office of Environment, Safety and Health Assessments (EA-30) is to assess the effectiveness of safety and emergency management systems and practices used by line and contractor organizations and to provide clear, concise, rigorous, and independent evaluation reports of performance in protecting workers, the public, and the environment from the hazards associated with DOE activities.

In addition to the general independent oversight requirements and responsibilities specified in DOE Order (O) 227.1A, *Independent Oversight Program*, this criteria and review approach document (CRAD), in part, fulfills the responsibility assigned to Enterprise Assessments (EA) in DOE O 226.1B, *Implementation of Department of Energy Oversight Policy*, and DOE O 440.1B, *Worker Protection Program for DOE (Including the National Nuclear Security Administration) Federal Employees*, to ensure contractors implement the requirements of 10 CFR 851, *Worker Safety and Health Program*, and DOE Policy (P) 450.4A, *Integrated Safety Management Policy*.

The CRADs are available to DOE line and contractor assessment personnel to aid them in developing effective DOE oversight, contractor self-assessment, and corrective action processes. The current revision of EA's CRADs are available at https://www.energy.gov/ea/criteria-and-review-approach-documents.

2.0 APPLICABILITY

The following CRAD is approved for use by the Office of Worker Safety and Health Assessments.

3.0 FEEDBACK

Comments and suggestions for improvements on this CRAD can be directed to the Director, Office of Environment, Safety and Health Assessments.

4.0 CRITERIA AND REVIEW APPROACH

The review of material handling (MH) safety assesses the effectiveness of programs and processes for ensuring the safety and health of workers during general industry work as well as construction work. The *Integrated Safety Management Policy*, DOE P 450.4A, establishes the Department's policy for work to be conducted safely and efficiently and in a manner that ensures protection of workers, the public, and the environment. To achieve this, implementation of integrated safety management (ISM) requirements are established through directives, and for contractor organizations through contract clauses. This includes identification of existing and potential workplace hazards and assessment of risk, development and implementation of hazard controls, assurance that work is performed within established hazard controls, and implementation of a formal mechanism and process to gather feedback and implement continual improvement by the site contractor.

This CRAD is primarily used to supplement work planning and control or construction safety assessments. However, it can be used to support a focused review of material handling safety when warranted by virtue of material handling safety performance occurring at a site or during Federal or contractor organization's work activities, or as part of an EA targeted review.

Additionally, assessments can include an evaluation of the DOE field element's process to assess the adequacy of procedures and implementation of the contractor's material handling safety program using Objective FO.1, *DOE Field Element Line Management implement risk-informed, performance-based contractor oversight*.

Many material handling hazards are not covered specifically by DOE invoked requirements but are expected to be identified and controlled during work planning and control activities or addressed by safety and health procedures prior to conducting work. The assessor should evaluate those drivers in the use of this CRAD. This CRAD provides the objectives and criteria for a safe material handling program, hoisting and rigging, forklift operations, manual material handling and ergonomics, heavy mobile equipment, loading and unloading, pallet jacks and material lifts, and the use of casters and rollers. Crane use will be addressed separately. Federal oversight of the MH program is also addressed.

The objectives and criteria and lines of inquiry are supported by the following regulations, orders, and resources/guides:

DOE Regulations and Orders

- 48 CFR 970.5223-1, *Integration of Environment, Safety, and Health into Work Planning and Execution*
- 10 CFR 851, *Worker Safety and Health Program*
- DOE O 226.1B, *Implementation of Department of Energy Oversight Policy*
- DOE O 231.1B Chg 1, *Environmental Safety and Health Reporting*
- DOE O 232.2A Chg 1 (MinChg), *Occurrence reporting and Processing of Operations Information*
- DOE O 440.1B, Chg 3 (LtdChg), *Worker Protection Program for DOE (including the National Nuclear Security Administration)*

- DOE-STD-1090-2020, *Hoisting and Rigging Manual (is a requirement when incorporated in the operator's Worker Safety and Health Program and/or cited as a requirement in the Contractor Requirements Document)*

OSHA Standards

- 29 CFR 1910.147*, The Control of Hazardous Energy*
- 29 CFR 1910.176, *Handling Materials – General*
- 29 CFR 1910.178, *Powered Industrial Trucks*
- 29 CFR 1910.184*, Slings*
- 29 CFR 1926.20*, General Safety and Health Provisions*
- 29 CFR 1926.21, *Safety Training and Education*
- 29 CFR 1926, subpart H*, Materials Handling, Storage, Use and Disposal*
- 29 CFR 1926.250, *General Requirements for Storage*
- 29 CFR 1926.251, *Rigging Equipment for Material Handling*
- 29 CFR 1926.600, *Motor Vehicles, Mechanized Equipment, and Marine Operations*
- 29 CFR 1926.602, *Material Handling Equipment*
- 29 CFR 1926.958, *Material Handling and Storage Near Energized Lines or Equipment*
- 48 CFR 970.5223-1, *Integration of Environment, Safety, and Health into Work Planning and Execution*
- Section 5(a)(1) of the General Duties Clause of the OSH Act

The following objectives are designed as stand-alone sections to be used in any combination based on the need of the specific assessment.

OBJECTIVES

<u>Material Handling Safety</u>

MH.1: A comprehensive safety program for material handling equipment and activity has been established and implemented that meets the requirements of 10 CFR 851, *Worker Safety and Health Program,* and DOE O 440.1B, Chg 3 (LtdChg), *Worker Protection Program for DOE (including the National Nuclear Security Administration*.)

Criteria:

MH safety program is documented in an approved worker safety and health program.

Lines of Inquiry:

1. Does the program include management and worker responsibilities including the stop work process; hazard identification, assessment, prevention and abatement; safety and health standards; functional areas, and training? (10 C.F.R. 851.20)
2. Does the program require a qualified worker safety and health staff direct and manage the program(s)? (10 C.F.R. 851.20(a)(2))
3. Does the program address the safe use of MH equipment and MH activities including the operation of forklifts and other powered industrial trucks; heavy equipment operation and motor vehicle safety; movement of heavy items; and hoisting and rigging? (10 C.F.R. 851.20 & 10 C.F.R. 851.21)
4. Does the program require workers trained and qualified commensurate with their duties and responsibilities? (10 C.F.R. 851.25)

5. Does the program require maintenance and repair to material handling equipment is conducted safely and hazardous energy is controlled? (29 C.F.R. 1910.147)

MH.2: A hoisting and rigging program is established that meets the requirements of 29 CFR 1926 for construction activities, 29 CFR 1910.184 and DOE-STD-1090-2020, *Hoisting and Rigging Manual,* for general industry activities.

Criteria:

Procedures are developed for hoisting and rigging, and include the appointment of a lift director, training and qualification of personnel, and the identification, inspection, and maintenance of equipment. (DOE-STD-1090-2020)

Lines of Inquiry:

1. Has a lift director been appointed for all hoisting and rigging operations? (DOE-STD-1090-2020, sections 1.2 and 2.2.2)
2. Are personnel performing hoisting and rigging activities trained and qualified? (DOE-STD-1090-2020, section 5, and 29 CFR 1926.753(d)(2)(iii))
3. Prior to initial use, has all new, repaired, or modified hoisting and rigging equipment been inspected by a qualified person to ensure compliance with applicable standards and that the periodic inspection is current? (DOE-STD-1090-2020, sections 6 & 7, 29 CFR 1910.184(d), and 29 CFR 1926.251)
4. Has rigging equipment for material handling been inspected prior to use on each shift? (29 CFR 1926.251(a)(1))
5. Have slings used for hoisting and all fastenings and attachments been inspected for damage or defects each day, before being used, by a competent person designated by the employer? (29 CFR 1910.184(d), 29 CFR 1926.251(a)(6), and DOE-STD-1090-2020, section 10)
6. Does hoisting and rigging equipment have permanently affixed and legible identification markings that indicate the safe working load? (29 CFR 1910.184 (c)(13 & 14), and 29 CFR 1926.251(a)(2))
7. Is hoisting and rigging equipment included in a preventive maintenance program? (DOE-STD-1090-2020)
8. Are synthetic slings, which are in contact with edges, corners, or protrusions, protected from cutting or damage with sufficient cut protection? Was the load rating determined by the cut protection product manufacturer or a qualified person? (29 CFR 1926.251(c)(9), 29 CFR 1910.184(c)(7), and DOE-STD-1090-2020, section 10.4)
9. Are the synthetic slings used appropriate for environmental conditions? Nylon web slings shall not be used where fumes, vapors, sprays, mists or liquids of acids or phenolics are present. Polyester and polypropylene web slings, or web slings with aluminum fittings, shall not be used where fumes, vapors, sprays, mists or liquids of caustics are present. (29 CFR 1910.184(i)(6) and 29 CFR1926.251(e)(6))
10. Is hoisting and rigging hardware that has been damaged and removed from service made unusable for hoisting and rigging operations before being discarded? (29 CFR 1910.184(d), 29 CFR 1926.251(a), and DOE-STD-1090-2020, section 11.2.2)

MH.3: A powered industrial truck (PIT)/forklift program has been established, that meets the requirements of 29 CFR 1910.178, 29 CFR 1926.602 and the intent of DOE-STD-1090-2020, *Hoisting and Rigging Manual,* for general industry activities.

Criteria:

The PIT/forklift program appropriately addresses operator training and qualification, and the safe operation and maintenance of the PIT/forklift. (DOE-STD-1090-2020, and 29 CFR 1910.178)

Lines of Inquiry:

1. Are operators of powered industrial trucks including forklifts and powered pallet jacks trained and qualified prior to operation and their competence evaluated based on the class of PIT they are operating? (29 CFR 1910.178(l), 29 CFR 1926.602(d), and DOE-STD-1090-2020, section 9.1)
2. Are operators of powered industrial trucks evaluated for performance every three years? Does the employer certify that each operator has been trained and evaluated on a certification that includes the name of the operator, date of training, date of evaluation, and the identity of the person performing the training or evaluation? (29 CFR 1910.178(l)(4)(iii), and 29 CFR 1910.178(l)(6))
3. Do PIT operators perform a pre-use inspection? (DOE-STD-1090-2020, section 9.1)
4. Are defects found that effect the safe operation reported and corrected before operation? (DOE-STD-1090-2020, section 9.1, and 29 CFR 1910.178(p))
5. Do PITs have the rated capacity clearly posted on the vehicle and visible to the operator? When auxiliary removable counterweights are provided by the manufacturer, are the corresponding alternate rated capacities also clearly shown on the vehicle? These ratings shall not be exceeded. (29 CFR 1926.602(c)(1), and 29 CFR 1910.178(a)(6))
6. Are manufacturers written approval obtained before making any modifications and additions which affect capacity and safe operation? Are the capacity, operation, and maintenance instruction plates, tags, or decals changed accordingly? Are repairs made by authorized personnel? (29 CFR 1910.178(a)(4), 29 CFR 1910.178(q)(1), and 29 CFR 1926.602(c)(1)(ii))
7. Do the PITs bear a label or some other identifying mark indicating approval by the testing laboratory and are they used in appropriate areas? (29 CFR 1910.178(a)(3), and 29 CFR 1926.602(c)(1)(vi))
8. When a PIT is equipped with an attachment, did the truck manufacturer establish the rated capacity of the truck/attachment combination? Are loads required to be within the rated capacity of the truck? (DOE-STD-1090-2020, section 9.2, 29 CFR 1910.178(a), and 29 CFR 1926.602(c)(1)(vi))
9. Have ensured that if a load is lifted by two or more trucks working in unison, the proportion of the total load carried by any one truck does not exceed its capacity. (29 CFR 1926.602(c)(1)(iii))
10. Have ensured that steering or spinner knobs are not attached to the steering wheel unless the steering mechanism is of a type that prevents road reactions from causing the steering handwheel to spin. Is the steering knob mounted within the periphery of the wheel? (29 CFR 1910.178(a)(2), and 29 CFR 1926.602(c)(1)(iv))
11. Are all high lift rider industrial trucks equipped with overhead guards? (29 CFR 1910.178(e)(1), and 29 CFR 1926.602(c)(1)(v))
12. Are there measures to ensure that the PIT is safe when left unattended? Do these include fully lowering the load engaging means, neutralizing controls, shutting off power and setting brakes? Are wheels blocked if the truck is parked on an incline? (29 CFR 1910.178(m)(5) and 29 CFR 1926.600(a)(3)(ii))
13. Are the brakes of highway trucks set and wheel chocks placed under the rear wheels to prevent the trucks from rolling while they are boarded with powered industrial trucks? Are fixed jacks used to support a semitrailer and prevent upending during the loading or unloading when the trailer is not coupled to a tractor or a docking mechanism? Are wheel stops or other recognized positive protection used to prevent railroad car movement while dockboards are in place? (29 CFR 1910.178(k) & (m)(7))
14. Is the storage and handling of liquid fuels such as gasoline and diesel fuel in accordance with NFPA Flammable and Combustible Liquids Code? (29 CFR 1910.178(f)(1))
15. Are battery charging installations located in areas designated for that purpose? (29 CFR 1910.178(g)(1))
16. Do PIT operators wear seatbelts and hearing protection (if required)? (29 CFR 1926.28(a), 1910.95(a), 1926.52(a), and 10 CFR 851, *Worker Safety and Health Program,* section 5(a)(1), *General Duties Clause of the OSH Act).*

MH.4: A heavy material equipment program for construction work including earth moving, excavating, and lifting and hauling, has been established that meets the requirements of 29 CFR 1926.602, *Material Handling Equipment*, and 29 CFR 1926.20(b), *General Safety and Health Provisions, Accident Prevention Responsibilities*.

Criteria:

Organizations have established procedures to ensure that heavy material equipment operators are trained and qualified, that heavy material equipment can be safely operated, and is properly maintained. (29 CFR 1926.602, and 29 CFR 1926.20(b)(2) & (4))

Lines of Inquiry:

1. Are operators trained and qualified on the heavy equipment they are operating prior to operation? (29 CFR 1926.20(b)(4))
2. Do equipment operators perform a pre-use inspection? Are defects that effect the safe operation reported and corrected before operation? (29 CFR 1926.20(b)(2))
3. Are seat belts provided on earthmoving equipment except those designed for standup operation only, and those which do not have roll over protection? Is there a requirement to wear the seatbelt? (29 CFR 1926.602(a)(2))
4. Is the access roadway constructed and maintained to accommodate safe movement of the equipment and vehicles involved? (29 CFR 1926.602(a)(3)(i))
5. Are emergency access ramps and berms constructed to restrain and control runaway vehicles? (29 CFR 1926.602(a)(3)(ii))
6. Does all heavy equipment have a service braking system, emergency brake and parking brake? Is the parking brake set when the equipment is parked? Are wheel chocks and parking brake used for equipment that is parked on inclines? (29 CFR 1926.602(a)(4))
7. Are all bidirectional machines equipped with a horn, distinguishable from the surrounding noise level, and operated as needed when the machine is moving in either direction? Is the horn maintained in an operative condition? (29 CFR 1926.602(a)(9)(i))
8. Are all earthmoving or compacting equipment, which has an obstructed view to the rear and used in reverse gear, equipped with a working reverse signal alarm (backup alarm) distinguishable from the surrounding noise level or a designated employee to signal that it is safe to do so. (29 CFR 1926.602(a)(9(ii))
9. Do motor vehicles have working brake lights and where conditions warrant, headlights and taillights? (29 CFR 1926.601(b)(2))
10. Do motor vehicles have an intact windshield with working windshield wipers? (29 CFR 1926.601(b)(5))
11. Do motor vehicles which are loaded from the top (e.g., dump trucks) have cab shields or canopies to protect the operator while loading? (29 CFR 1926.601(b)(6))
12. Does equipment have roll-over protection and protection from falling debris hazards as needed? (29 CFR 1926.602(a)(6) and 29 CFR 1926.1001(a))
13. Are scissor points on all front-end loaders, which constitute a hazard to the operator during normal operation, guarded? (29 CFR 1926.602(a)(10))
14. Does all equipment comply with the requirements of 29 CFR 1926.600 when working or being moved in the vicinity of power lines or energized transmitters?
15. Is driving in reverse gear with an obstructed rear view prohibited, unless the vehicle has an audible alarm, or a signaler is used? (29 CFR 1926.602(a)(9)(ii))

MH.5: Material moved by powered or manual pallet jacks and material lifts are safely loaded, moved, and unloaded as required by 48 CFR 970.5223-1, 29 CFR 1910.178, 10 CFR 851.21, 10 CFR 851.22, and DOE O 440.1B, Chg 3 (LtdChg).

Criteria:

Hazards encountered when loading, moving and unloading materials from manual pallet jacks are adequately identified and controlled. (48 CFR 970.5223-1, 29 CFR 1910.178, 10 CFR .851.21, 10 CFR 851.22, and DOE O 440.1B, Chg 3 (LtdChg)).

Lines of inquiry:

1. Do motorized hand trucks enter elevator or other confined areas with load end forward? (29 CFR 1910.178(n)(13))
2. Is the pallet jack used safely by implementing the following good practices?
    - The pallet jack is appropriate to materials, length of travel, use (moving pallets, equipment, loose boxes/bags, etc.), task ergonomics, etc.
    - The pallet jack is inspected daily or before use for cracks, signs of defects, or damage
    - The pallet jack has been maintained to ensure workers can operate with a minimum amount of hand, arm, or finger force
    - Check the floor (including trailers and truck beds) for ruts, bumps, and other imperfections
    - Never place feet under a pallet jack
    - Be aware of pedestrian and other equipment movement; if view is obstructed, use a spotter assist
    - Never exceed a pallet jack's load capacity
    - Ensure load is stable before moving
    - Don't transport people
    - Push going down an incline, don't pull
    - Stick to correct traffic lanes and be alert to avoid collisions around corners
    - Avoid pinch point hazards
    - Use proper lifting techniques when loading and unloading (e.g., raise pallet jack to eliminate stooping)

MH.6: Equipment used to hold material (including toolboxes) or move material (e.g., dolly) with casters or rollers are used safely. (48 CFR 970.5223-1 and DOE O 440.1B, Chg 3 (LtdChg))

Criteria:

Programs and practices are in place to ensure that equipment used to hold or move material is used safely. (48 CFR 970.5223-1 and DOE O 440.1B, Chg 3 (LtdChg))

Lines of Inquiry:

1. Is equipment with casters and rollers inspected regularly to ensure they function as designed, are not cracked or damaged, flat or underinflated, and are securely fastened to the equipment?
2. Is equipment with casters and rollers inspected before use for damages or defects?
3. Are floors and travel routes inspected for cracks, holes, gaps, bumps, and any other impediments to safe caster or roller movement?
4. Is equipment (such as dollies) with casters or rollers not overloaded (e.g., total weight) or improperly loaded (e.g., high center-of-gravity)?

MH.7: Materials are safely loaded, transported onsite, and unloaded in a manner to preclude hazardous movement, dropped loads, and/or material falling off vehicles in accordance with 10 CFR 851.21, 10 CFR 851.22, 29 CFR 1910.178, 48 CFR 970.5223-1, and DOE O 440.1B, Chg 3 (LtdChg).

Criteria:

Hazards of material handling when manually loading and unloading materials from vehicles such as box and flatbed trucks/trailers are adequately identified and controlled. (10 CFR 851.21, 10 CFR 851.22, 48 CFR 970.5223-1, and DOE O 440.1B, Chg 3 (LtdChg))

Lines of inquiry:

1. Are all loads handled stable or safely arranged and caution exercised when handling off-center loads which cannot be centered? (29 CFR 1910.178(o)(1))
   - Are vehicles chocked or connected to a docking mechanism (dock lock) to prevent movement during loading and unloading?
   - Are loads properly distributed and strapped, blocked or braced to prevent movement?
   - Are web strap or chain tie downs or load binders appropriate to load and are they inspected prior to use for defects?
   - Are awkward and heavy materials evaluated (e.g., size/shape/weight/center of gravity) for use of proper methods to safely load or unload?
   - Do workers position themselves in a safe location when opening vehicle doors or prior to releasing strapping/blocking/bracing?
   - Are proper equipment types used to safely move material, such as using a lift gate to raise and lower large, heavy, or awkward to handle material?
   - Are pre-job briefs held to plan the loading and unloading of materials? Are other methods used to train workers on hazards, such as safety training, documented skill-of-the-craft training and expertise, hazard analyses, and/or procedures? Do workers know when to ask for assistance when manually loading or unloading material?
   - Are loading and unloading activities analyzed for compliance with American Conference of Governmental Industrial Hygienists (ACGIH) lifting and/or repetitive motion threshold limit values (TLVs)?
2. Was a hazard analysis completed to identify required PPE during loading and unloading tasks as well as for any potential hazardous material exposures from the load? (29 CFR 1910.132(d))

MH.8: Manual material handling hazards are identified, and recognized controls are implemented as required by 10 CFR 851.21 and10 CFR 851.22, and 29 CFR 1910.132.

Criteria:

1. Organizations have established procedures to effectively address ergonomic hazards including the 2016 Edition of ACGIH *Threshold Limit Values for Chemical Substances and Physical Agents and Biological Exposure Indices* or a newer, more protective editions. (10 CFR 851.11(a)(3)(i), 10 CFR 851.23(a)(9), and DOE O 440.1B, Chg 3, sections 4.a. and 4.m.(9))
2. Non-ergonomic hazards associated with material handling are adequately controlled through personal protective equipment or additional administrative and engineering controls. (29 CFR 1910.132, 10 CFR 851.21 and 10 CFR 851.22)

Lines of Inquiry:

1. Do work control documents and/or procedures identify and control exposures to improper movement techniques or use of proper moving equipment (e.g., trying to carry awkward shaped material alone or using equipment not designed or approved for the type of handling operation)?
   - Awkward postures (e.g., bending, twisting)
   - Forceful exertions (e.g., carrying or lifting heavy loads)

- Pressure points (e.g., grasping [or contact from] loads, leaning against parts or surfaces that are hard or have sharp edges)
- Static postures (e.g., maintaining fixed positions for a long time)
- Repetitive motions (e.g., frequent reaching, lifting, carrying)

2. Do work control documents and/or procedures identify and control exposures to the following risk factors associated with manual handling tasks:
   - Movement of or falling objects from improperly stacked materials
   - Struck by materials being moved or by being caught in pinch points
   - Cutting ties or other securing devices improperly
   - Loads not centered properly
   - Visual impairment due to load configuration or obstructed views
   - Sharp or rough edges of materials being handled
   - Striking other objects while moving material

MH.9: All material is stored in a manner to eliminate hazards in accordance with 29 CFR 1926.250, *General Requirements for Storage,* and 29 CFR 1910.176*, Materials Handling and Storage.*

Criteria:

All materials stored in tiers shall be stacked, racked, blocked, interlocked and limited in height, or otherwise secured to prevent sliding, falling or collapse. (29 CFR 1926.250(a)(1) and 29 CFR 1910.176)

Lines of Inquiry:

1. Has the employer conspicuously posted maximum safe load limits of floors within buildings and structures, in pounds per square foot, in all storage areas, except when the storage area is on a floor or slab on grade? Does the weight of stored materials on floors within buildings and structures exceed maximum safe load limits? Are permanent aisles and passageways appropriately marked? (29 CFR 1926.250(a)(2) and 29 CFR1910.22(b))
2. Are aisles and passageways kept clear to provide for the free and safe movement of material handling equipment or employees? Are these areas kept in good repair? (29 CFR 1926.250(a)(3) and 29 CFR 1910.176(a))
3. Are materials stored inside buildings under construction placed more than 6 feet from any hoistway or inside floor openings, or more than 10 feet from an exterior wall which does not extend above the top of the material stored? (29 CFR 1926.250(b)(1))
4. Are noncompatible materials segregated in storage? (29 CFR 1926.250(b)(3) and 29 CFR 1910.176(c))
5. Are bagged materials stacked by stepping back the layers and cross-keying the bags at least every 10 bags high? (29 CFR 1926.250(b)(4) and 29 CFR 1910.176(b))
6. Are more materials stored on scaffolds or runways than needed for immediate operations? (29 CFR 1926.250(b)(5))
7. Do brick stacks exceed more than 7 feet in height? When a loose brick stack reaches a height of 4 feet, is it tapered back 2 inches in every foot of height above the 4-foot level? (29 CFR 1926.250(b)(6))
8. Are masonry blocks stacked higher than 6 feet tapered back one-half block per tier above the 6-foot level? (29 CFR 1926.250(b)(7))
9. Does used lumber have all nails withdrawn before stacking? Is lumber stacked on level and solidly supported sills? Is lumber stacked to be stable and self-supporting? Do lumber piles not exceed 20 feet in height? Does lumber handled manually not stacked more than 16 feet high? (29 CFR 1926.250(b)(8))
10. Is structural steel, poles, pipe, bar stock, and other cylindrical materials, unless racked, stacked and blocked so as to prevent spreading or tilting? (29 CFR 1926.250(b)(9))

11. Are storage areas kept free from accumulation of materials that constitute hazards from tripping, fire, explosion, or pest harborage? (29 CFR 1926.250(c) and 29 CFR 1910.176(c))

MH.10: Feedback and improvement processes are effective in addressing and preventing the recurrence of issues with the material handling program. (DOE O 226.1B)

Criteria:

A formal process is established and implemented to gather feedback and implement continuous improvement of the material handling program elements, implementation, and the adequacy of hazard identification, prevention, abatement, and controls. (DOE O 210.2A, attachment 1, CRD, section 1.a; DOE O 226.1B, attachment 1, section 2.b.(5); 48 CFR 970.5223-1(c)(5); and 10 CFR 851.26(b))

Lines of Inquiry:

1. Do the contractor's programs and procedures include written plans and schedules for planned assessments, focus areas for operational oversight, and reviews of the contractor's self-assessment of processes and systems?
2. Does the contractor assurance system include credible self-assessments, and feedback and improvement activities?
3. How does management communicate the results of these assessments to all affected management and workers?
4. What are the procedures for the development of corrective actions?
5. How does management ensure the corrective actions are implemented, and effective?
6. How does management incorporate lessons learned into future work planning, activities, and training for continuous improvement?
7. Does the contractor develop lessons learned that focus on preventing adverse events, trends, and reliability related events, and on performance improvement?
8. Does the contractor screen, distribute, and review DOE corporate operating experience program documents and external operating experience documents for site specific relevance, risks, and vulnerabilities, and take appropriate actions?
9. Does the contractor incorporate operating experience into their activities and processes?

Federal Oversight of Material Handling Safety

FO.1: DOE field element line management implements risk-informed, performance-based contractor oversight. (DOE O 226.1B)

Criteria:

The DOE field element evaluates contractor and DOE programs and management systems, including site assurance systems, for effectiveness of performance (including compliance with requirements). Such evaluations must be based on the results of operational awareness activities; assessments of facilities, operations, and programs; and assessments of the contractor's assurance system. The level and/or mix (i.e., rigor or frequency in a particular area) of oversight may be tailored based on considerations of hazards, the maturity and operational performance of the contractor's programs and management systems. (DOE O 226.1B, section 4b(1))

Lines of Inquiry:

1. Is DOE oversight based upon the complexity and hazards of the material handling activity?
2. Does the DOE field element line management have sufficient qualified personnel to implement oversight processes? Are the Facility Representatives and subject matter experts fully qualified in the technical qualification program?
3. Do Facility Representatives provide operational awareness oversight of material handling activities in their assigned facilities?
4. Do subject matter experts perform oversight of material handling activities as part of their routine oversight?
5. Does oversight include determining that the work is performed in accordance with the approved worker safety and health program and ISMS description documents, that hazards are recognized and controlled, and that workers are appropriately protected for the material handling hazards?
6. Are assessments and operational awareness oversight planned, scheduled, conducted, and documented for material handling safety, and identify areas for needed improvement?
7. Are assessments and operational awareness results documented, communicated to the contractor, and captured in an issues management system, as appropriate?

REVIEW APPROACH

Record Review:

- Worker safety and health program
- Project construction safety and health plan(s)
- Material handling procedures
- Activity hazard analyses for observed work
- Pre-job briefings/tailgate meeting records
- Industrial hygiene monitoring results
- MH worker/operator training records:
  - Mobile equipment
  - Personal protective equipment
  - Powered platforms
  - Powered industrial trucks (forklifts, powered jacks, etc.)
- Equipment manufacturer's operating manuals
- Maintenance and inspection records
- DOE oversight records of construction projects (assessment schedules; assessments; operational awareness; performance trending; corrective actions and issues management; contract actions for poor performance)
- DOE technical qualification records
- DOE assessment schedule
- Lockout/tagout program

Interviews:

- DOE industrial/construction safety subject matter expert
- DOE Facility Representatives
- Contractor industrial health and safety manager
- Contractor construction manager
- Designated competent personnel
- Lift director
- Supervisory; Person in charge
- Onsite safety professional
- Corporate safety and health professionals

- Worker and trade personnel
- Warehouse/transportation manager

Observations:

- Selectively walk down construction site or work activity and observe active material handling work.