Engineering Standard

SAES-B-053 30 June, 2003

Machine Safety Guarding,
Elevators, Escalators, and Conveyors

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1 Scope

This Standard addresses requirements for the protection of employees from accidentally contacting the moving parts of all rotating equipment, prime movers, elevators, escalators, material conveyors and related equipment and other points of power machine transmission. This Standard may be attached to purchase orders.

2 Conflicts and Deviations

2.1 Any conflicts between this Standard and other applicable Saudi Aramco Engineering Standards (SAESs), Saudi Aramco Materials System Specifications (SAMSSs), Saudi Aramco Standard Drawings (SASDs), or industry standards, codes, and forms shall be resolved in writing by the Company or Buyer Representative through the Manager, Loss Prevention Department of Saudi Aramco, Dhahran.

2.2 Direct all requests to deviate from this Standard in writing to the Company or Buyer Representative, who shall follow internal company procedure SAEP-302 and forward such requests to the Manager, Loss Prevention Department of Saudi Aramco, Dhahran.

3 References

The selection of material and equipment, and the design, construction, maintenance, and repair of equipment and facilities covered by this Standard shall comply with the latest edition of the references listed below, unless otherwise noted.

3.1 Saudi Aramco References

Saudi Aramco Engineering Procedure

SAEP-302	*Instructions for Obtaining a Waiver of a Mandatory Saudi Aramco Engineering Requirement*

Saudi Aramco Engineering Standard

SAES-N-001	*Basic Criteria, Industrial Insulation*

3.2 Industry Codes and Standards

Process Industry Practices

PIP INEG1000	*Insulation Design and Type Codes*

American National Standards Institute

ANSI/ASME A17.1	*Safety Code for Elevators and Escalators*

ANSI/ASME B15.1	*Safety Standards for Mechanical Power-Transmission Apparatus*
ANSI/ASME B20.1	*Safety Standards for Conveyors and Related Equipment*

National Safety Council

Accident Prevention Manual for Business and Industry, Engineering and Technology, National Safety Council, Itasca, Illinois; ISBN 0-87912-192-0

4 Definitions

Accessible Area: An area into which personnel can walk or crawl to perform duties other than maintenance during plant operation.

Cold surface: For the purposes of this Standard, a cold surface is any object, piping, wall, or other accessible place that is at or below minus 7°C.

Conveyor: A horizontal, inclined, or vertical device for moving or transporting bulk material, packages, or objects, in a path predetermined by the design of the device, and having points of loading and discharge, fixed or selective. Included are skip hoists, vertical reciprocating and inclined reciprocating conveyors. Items not included are trucks, tractors, cranes, hoists, manlifts, and other items as specified in ANSI/ASME B20.1.

Elevator: A hoisting and lowering mechanism, equipped with a car, that moves within guides and serves two or more landings and is classified according to ANSI/ASME A17.1.

Escalator: Power-driven, inclined, continuous stairway used for raising or lowering passengers.

Hot surface: For the purposes of this Standard, a hot surface is any object, piping, wall, or any other accessible place that is at or above 60°C.

Power machine transmission: Includes all mechanical parts, such as gears, cams, shafts, pulleys, belts, clutches, brakes, and rods, that transmit energy and motion from a source of power to equipment or a machine.

Point of operation: The area of a machine where material is positioned for processing, where work is actually being performed on the material.

5 General Requirements

5.1 Any machine, the use of which could conceivably involve point of operation hazards, shall be checked for proper guarding methods. For rules regarding "point of operation" guards, see the chapter on Safeguarding in the Accident Prevention Manual for Business and Industry, Engineering and Technology.

5.2 Powered machine transmission guarding shall meet ASME B15.1.

5.3 Elevators and escalators shall meet ASME A17.1.

5.4 Conveyors of materials and related equipment shall meet ASME B20.1.

5.5 Revolving, oscillating, reciprocating or other moving parts located 2.5 m or less above the floor or working level having projecting parts or hazardous recesses shall be permanently and securely protected with guards.

5.6 Fin fan cooler blades shall be guarded so that if the blades break, the blades do not fall into any accessible personnel walking / working area, regardless of their elevation.

5.7 Guards shall be non-combustible and shall be otherwise designed in such a way not to create a potential source of ignition.

5.8 Counterweights shall be either enclosed with a guard or equipped with safety chains or cable or otherwise protected against falling. If a counterweight is so located that it is possible to walk under or crawl under the weight, it shall be enclosed with a guard or barricaded to prevent access.

5.9 All accessible hot surfaces (greater than 60°C) or cold surfaces (lower than minus 7°C) within 2.5 m vertical or 1 m horizontal from an elevated walkway or on-grade accessible area and shall be covered with insulation, shields, guards, or barriers to prevent contact injury to people. For insulation, refer to SAES-N-001 and PIP INEG1000.

Revision Summary

30 June, 2003 Revised the "Next Planned Update". Reaffirmed the contents of the document, and reissued with minor changes.