

## FESHM 10190: CRANE PERSONNEL LIFTING PLATFORMS (MAN-BASKETS)

### Revision History

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Angela Aparicio Marcel Borcean	Initial release Chapter 10190	June 2018

**DRAFT**

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## 1.0 INTRODUCTION

This chapter specifies the design, inspection, use and maintenance requirements of personnel lift platforms suspended from cranes at Fermilab. The use of a crane to hoist employees on a personnel platform is prohibited, except when the erection, use and dismantling of conventional means of reaching the work area (e.g. personnel hoist, ladder, stairway, aerial lift, elevating work platform, or scaffold) would be more hazardous, or is not possible because of industrial design or worksite conditions.

## 2.0 DEFINITIONS

**Ground Crew** – those individuals who are involved in the personnel lift, other than the hoisting equipment operator and platform occupants. These individuals include riggers, signal persons, and supervision.

**Lift Director** – a person who directly oversees the work being performed by the hoisting equipment and the associated ground crew.

**Lifting, personnel** – raising, lowering or transporting personnel using hoisting equipment covered by the ASME B30 Standard.

**Live Load Line** – a load line whose lowering is controlled by a brake without the aid of other lowering retarding devices (free-fall capable).

**Load, rated** – capacity or rating established by the manufacturer or a qualified person for a stipulated hoisting equipment configuration.

**Load, working** – the external load applied to the hoisting equipment, including the personnel lifting platform, its contents, and the load-attaching equipment, such as lower load block, shackles, and slings.

**Occupant, platform** – a person who is within the guardrail barrier while the personnel platform is in a hoisted position.

**Personnel Lift Authorizer** – a person who verifies compliance with the provisions of 29 CFR 1926 and ASME B30 standards.

**Platform, personnel - suspended** – platform attached to hoisting equipment using wire rope, chair, or jointed attachment and that has no installed motion controls for the platform itself.

**Platform, rating** – the maximum capacity of a personnel lifting platform, established by the platform manufacturer, in terms of weight and number of occupants allowable.

44 **Qualified Person** - a person who, by possession of a recognized degree in an applicable field or  
 45 certificate of professional standing or by extensive knowledge, training, and experience, has  
 46 successfully demonstrated the ability to solve or resolve problems relating to the subject matter and  
 47 work.

48  
 49 **Two-Blocking** – the condition in which the lower load block or hook assembly comes in contact with  
 50 the upper load block or boom point sheave assembly.

51

## 52 **3.0 RESPONSIBILITIES**

53

### 54 **3.1 Division/Section Head**

55 The Division/Section Head, or designee, is responsible for implementing this program. Specifically,  
 56 he/she is responsible for:

- 57 • Designating a “lift director” for each personnel lift operation that will occur in their area.

58

### 59 **3.2 ESH&Q Section**

60 The ESH&Q Section is responsible for:

- 61 • Providing consultation services to division/section heads regarding safety of operations and  
 62 training opportunities.
- 63 • Maintaining training records of operators in the TRAIN database.
- 64 • Designating a qualified person as the crane operator evaluator.

65

### 66 **3.3 Division Safety Officer(DSO)/Personnel Lift Authorizer**

67 The Division Safety Officer is responsible for:

- 68 • Verifying that there are no less hazardous alternatives to performing the work or providing  
 69 access to the area. The personnel lift shall not be authorized when less hazardous means are  
 70 feasible.
- 71 • Verifying the equipment to be used for the personnel lift meets the requirements of this chapter.
- 72 • Authorizing the personnel lift operation in writing by approving the *Personnel Platform Lift*  
 73 *Planning and Authorization Form* (Form F1).

74

### 75 **3.4 Facilities Engineering Services Section (FESS)**

76 The Facilities Engineering Services (FESS) Section is responsible for:

- 77 • Maintaining manuals and manufacturer information and records related to testing, inspection,  
 78 and repair of personnel lifting systems. This includes the distribution of related reports to the  
 79 landlord division/section head or his/her designee.
- 80 • Arranging for an initial inspection of all new, repaired or modified baskets.
- 81 • Arranging contracts with qualified subcontractors to perform annual inspections, testing and  
 82 maintenance of personnel lifting systems. FESS/FM Crane Office will provide oversight of  
 83 the subcontractor.

84

### 85 **3.5 Lift Director (The Person-in-Charge (PIC))**

86 The Lift Director is responsible for:

- 87 • Preparing the personnel lift plan (see *Personnel Platform Lift Planning and Authorization*
- 88 *Form*, Form F1), which is to be presented to the personnel lift authorizer for review/approval.
- 89 • Holding the pre-lift meeting.
- 90 • Posting the approved *Personnel Platform Lift Planning and Authorization Form* at the work
- 91 site.
- 92 • Verifying qualified persons are assigned to perform the functions of the operator,
- 93 signalpersons, and ground crew.
- 94 • Supervising the personnel lift operation.
- 95 • Requiring the personnel lift be accomplished in accordance with the provisions of this chapter.
- 96 • Upon completion of the work covered by the lift plan, submitting the *Personnel Platform Lift*
- 97 *Planning and Authorization Form* (Form F1) and *Personnel Lift Platform Proof Test and Pre-*
- 98 *Lift Inspection Form* (Form F2) to ESH&Q, MS-119, for inclusion in the centralized lift plan
- 99 file.

### 101 3.6 Qualified Operator

102 The Qualified Operator is responsible for:

- 103 • Passing a fit-for duty exam, which includes a substance abuse test.
- 104 • Completing and remaining current in Crane Personnel Basket Operation Training (FN000578).
- 105 • Ensuring the hoisting equipment is capable/acceptable for lift personnel, per the requirements
- 106 of this chapter.
- 107 • Understanding the operational limitations.
- 108 • Confirming that all hoisting equipment inspections have been completed and are satisfactory,
- 109 prior to starting the lift (see *Personnel Lift Platform Proof Test and Pre-Lift Inspection Form*,
- 110 Form F2).
- 111 • Operating the hoisting equipment in compliance with the procedures specified in this chapter.

112 The Qualified Operator shall not lift personnel if:

- 113 ○ The operator does not feel physically or mentally fit to perform the operation.
- 114 ○ The operator has been working for more than 10 hours prior to the start of the lift, or
- 115 the lift will not be completed before the operator has been working for 12 hours.
- 116 ○ The operator did not have at least 8 hours off immediately prior to the work shift.
- 117 • While operating the hoisting equipment, the operator shall not engage in any practice that will
- 118 divert his/her attention.
- 119 • The operator shall only respond to signals from a designated signalperson, except that the
- 120 operator shall obey a stop signal at any time, no matter who gives it.
- 121 • Whenever the operator has any doubt as to the safety of the lift, the operator shall consult with
- 122 the lift director before commencing or continuing the lift.
- 123
- 124

### 125 3.7 Platform Occupants

126 The platform occupants are responsible for:

- 127 • Completing and maintaining current Fall Protection Orientation training (FN000304)
- 128 Attending the pre-lift meeting to be instructed in the recognized hazards of personnel platform
- 129 lifts, such as:

- 130           o Impacting structures outside the platform
- 131           o Unexpected platform motion
- 132           o Any special hazards associated with the lift
- 133       • Reviewing and signing the job hazard analysis.
- 134       • While in the platform:
  - 135           o Maintain a stable and even loading on the platform
  - 136           o Keep all parts of their body inside the platform during raising, lowering, and
  - 137           positioning, except when performing duties as a designated signalperson
  - 138           o Not interfering with the platform operator or the designated signalperson in the
  - 139           platform, except to give an emergency stop signal
  - 140           o Keeping their personnel fall protective device lanyard fastened to the provided
  - 141           anchorage points at all times while occupying the platform
  - 142           o Being familiar with means of communication while in the platform. All occupants
  - 143           shall know how to implement an emergency stop.

#### 145       **4.0 PROGRAM DESCRIPTION**

146  
 147       When the use of a crane-suspended personnel platform/basket is found to be the safest alternative, its  
 148       use shall meet 29 CFR 1926.1431 and the requirements of this chapter. Use requires approval of the  
 149       Division Safety Officer (or designee) for the area where the lift will occur. This chapter describes the  
 150       requirements of using a personnel platform suspended from a building crane. Prior to using a personnel  
 151       platform suspended from a mobile crane, the Mechanical Safety Subcommittee and Division Safety  
 152       Officer must be consulted for additional guidance.

#### 154       **5.0 PROCEDURES**

##### 156       **5.1 Training**

157       Personnel who operate cranes with a personnel platform suspended from the crane must complete the  
 158       following training:

##### 160       **5.1.1. Crane Operator Training**

161       Qualified operators must complete and remain current in the Crane Operator Training for  
 162       Fermilab Employees and Evaluation (FN000005/CR/01 & FN000005/EV/01).

##### 164       **5.1.2. Crane Personnel Basket Operation Training**

165       Qualified operators must complete and remain current in the Crane Personnel Basket Operation  
 166       Training (FN000578/CR/01).

168       Personnel platform occupants must complete the following training prior to riding on the platform:

##### 170       **5.1.3. Fall Protection Orientation**

171       All occupants must have complete and current Fall Protection Orientation training  
 172       (FN000304/CR/01).

## 174 **5.2 Personnel Platform Requirements**

175 Platforms used in the transport of personnel must be designed by a qualified person competent in  
176 structural design and familiar with national consensus standards governing personnel platform design.  
177 Design requirements include, but are not limited to, the following:

- 178 • An identification plate specifying the empty weight of the platform, and its rated load capacity  
179 or maximum intended load.
- 180 • Guardrail protection consisting of a top rail 39 - 45 inches high and a midrail approximately  
181 halfway between the top rail and the toeboard.
  - 182 ○ The toprail and midrail shall be capable of withstanding a concentrated load of 300  
183 pounds applied at any point.
- 184 • A grab rail inside the platform to minimize hand exposure.
- 185 • Anchorage points within the platform for attaching personnel fall protection lanyards.
- 186 • The sides of the platform must be enclosed from the toeboard to the midrail with solid  
187 construction or expanded metal having openings no greater than ½ inch.
- 188 • Platform access gates shall have a positive acting device to restrain the gate from accidental  
189 opening. Swinging type gates shall open only to the interior of the platform.
- 190 • All welds shall be in accordance with American Welding Society or ASME guidelines.
- 191 • The platform shall have a minimum design factor of 5, based on the stated platform rating.

## 193 **5.3 Engineering Note Procedure**

194 An Engineering Note shall be prepared by a qualified person for all personnel platforms owned by  
195 Fermilab or collaborating institutions used at Fermilab whether purchased or fabricated at Fermilab or  
196 a collaborating institution. The minimum format for the Engineering Note is shown in the appendix  
197 of this chapter. The purpose of the Engineering Note is to allow a reviewer to check the design and to  
198 inform future users of the personnel platform's limitations.

- 199 1. Engineering Notes for personnel platforms designed at Fermilab or other non-commercial  
200 institutions such as Universities or other Laboratories shall include design compliance  
201 calculations to verify that the personnel platform meets as a minimum the requirements of  
202 ASME B30.23 and 29 CFR 1926.
- 203 2. Engineering Notes for personnel platforms purchased from a commercial source engaged in  
204 the manufacturing of personnel platforms shall include the manufacturer's Certificate of Test,  
205 copies of the Operator's Manual and Inspection and Maintenance Instructions.
- 206 3. Modifications to personnel platforms (whether designed at Fermilab or other non-commercial  
207 institutions or purchased from a commercial source) shall be documented in the Engineering  
208 Note.
- 209 4. All Engineering Notes shall include all safety precautions, operating, and maintenance  
210 procedures, recommended inspection frequency, and complete nameplate data required for the  
211 personnel platform.
- 212 5. All personnel platforms are subject to the test requirements of 29 CFR 1926.1431, the  
213 manufacturer, and this chapter. Operational and load tests shall be performed using hoisting  
214 equipment of the proper size and capacity for the personnel platform being tested. Initial load  
215 tests shall be documented in the engineering note.
- 216 6. Review of Engineering Notes: All personnel platform Engineering Notes shall be reviewed by  
217 a qualified person for compliance with the requirements of this chapter.



- 218 7. Amendment of Engineering Notes: All subsequent changes in usage that could affect the safety  
 219 of personnel shall require an amendment to the original engineering note. This amendment  
 220 shall be reviewed in the same manner as the original note.  
 221 8. Engineering Note for Existing Personnel Platforms: Personnel platforms currently in use at  
 222 Fermilab shall be inspected and reviewed with an Engineering Note prepared. Personnel  
 223 platforms without an Engineering Note shall not be used.  
 224 9. Approved engineering notes shall be filed in TeamCenter.  
 225

#### 226 **5.4 Hoisting Equipment Requirements**

227 All hoisting equipment used to lift personnel on platforms must be constructed in accordance with  
 228 ASME B30. All hoisting equipment shall be inspected prior to being used for personnel lifting in  
 229 accordance with the defined “Inspection Classification” requirements of the applicable volume of the  
 230 ASME B30 Standard. All operational aids on the hoisting equipment shall be functional. All hoisting  
 231 equipment must be verified as meeting the following requirements prior to being used for personnel  
 232 lifting:

- 233 • Load lines shall be capable of supporting, without failure, a minimum of seven times the  
 234 maximum intended load. If the crane is equipped with rotation-resistant rope, the lines  
 235 must be capable of supporting, without failure, a minimum of ten times the intended load.
- 236 • Rope or chain hoisting systems shall have an anti-two block device installed.
- 237 • Hooks used for attachment of a personnel lifting platform shall be of a type that can be  
 238 positively locked closed and will prevent the platform lifting bridle from being dislodged.
- 239 • Hoisting equipment shall have automatic brakes on all functions to be used during  
 240 personnel handling, such that when the equipment operating controls are released, the  
 241 motions are brought to rest.  
 242

#### 243 **5.5 Rigging Requirements**

- 244 • The designated rigging for attaching the personnel platform to the hoist line shall not be  
 245 used for any other purpose than hoisting personnel.
- 246 • When a wire rope bridle is used to connect the personnel platform to the load line, each  
 247 bridle leg shall be connected to a master link or shackle in such a manner as to ensure that  
 248 the load is evenly divided among the bridle legs.
- 249 • Wire rope, shackles, rings, master links, and other rigging hardware shall be capable of  
 250 supporting, without failure, at least five times the maximum intended load applied or  
 251 transmitted to that component. Where rotation-resistant rope is used, the slings shall be  
 252 capable of supporting without failure at least ten times the maximum intended load.  
 253

#### 254 **5.6 Pre-Lift Meeting**

255 A meeting attended by the operator, the ground crew, signaler(s), person(s) to be lifted, and the  
 256 designated leader shall be held each shift to plan and review procedures to be followed, including:

- 257 • Ensuring the *Personnel Platform Lift Planning and Authorization Form* (Form F1) has  
 258 been completed and attached to the hazard analysis.
- 259 • Points at which persons will enter and leave the platform
- 260 • Procedures for entering and leaving the platform
- 261 • How to implement an emergency stop



- Special precautions if personnel will perform work from the suspended platform

This meeting shall be repeated for any personnel newly assigned to the operation.

### 5.7 Trial Lifts (Proof Test)

Proof tests are required any time the basket is installed on a crane. The basket must be uniformly loaded to 125 percent of the basket rated load. The load test must be held for at least five minutes. The weighted basket must be lowered to a test position and held by the hoist brake for five minutes.

The proof test must be documented on the *Personnel Lift Platform Proof Test and Pre-Lift Inspection Form* (Form F2). The form is to be filed with ESH&Q, MS-119.

### 5.8 Platform Inspection

The platform, suspension system, attachment points, and any platform motion controls shall be inspected at least once each day before use, following the proof test. Any conditions found that constitute a hazard shall be corrected prior to lifting personnel. The inspection must be documented on the *Personnel Lift Platform Proof Test and Pre-Lift Inspection Form* (see Form F2). The form is to be filed with ESH&Q, MS-119.

Each personnel platform will undergo a periodic inspection by a third party at least once every 12 months. Any platform that has been out of service for 12 or more consecutive months must receive a periodic inspection prior to use. (This inspection will be managed and have oversight by FESS/FM Crane Office.)

### 5.9 Platform Repairs

Replacement parts used or repairs made shall be equal to or exceed the original equipment specification.

All welding repairs shall be done by a certified welder.

Any adjustment or repair to the platform suspension system shall be done by a qualified person.

Only modifications approved in writing by the manufacturer or a qualified person shall be accomplished.

After any structural repair or modification of the personnel lift platform, the platform's Engineering Note must be revised, reviewed and approved (see Section 5.3). The platform and rigging shall be proof-tested to 150 percent of the platform's rated capacity. Suspended platforms shall be tested by raising the loaded platform to a height, then lowering it at a speed of not less than 100 feet per minute. Once a lowering speed of 100 feet per minute or more is reached, the platform descent shall be halted, and then the platform allowed to hang for a period of not less than 5 minutes. Any damage revealed by the inspection shall be corrected and another proof test conducted. The platform shall not be used for hoisting personnel until the proof-testing requirements are satisfied.

306 **6.0 REFERENCES**

- 307
- 308 American Society of Mechanical Engineers (ASME) B30.23 – Personnel Lifting Systems (subpart of
- 309 the Safety Standard for Cableways, Cranes, Derricks, Hoists, Hooks, Jacks, and Slings)
- 310
- 311 Occupational Safety and Health Administration (OSHA) 29 CFR 1926.1431 – Hoisting Personnel
- 312
- 313 Fermilab Environment, Safety and Health Manual 10100 – Overhead Cranes and Hoists

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