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Doc Custodian: Safety Supervisor		PR-22 Temporary Construction Elevator Guidelines
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1.0 Purpose

To provide site specific guidance for the assembly and disassembly of temporary construction elevators at the Galveston Bay Refinery (GBR).

2.0 Scope

- 2.1 This guideline applies to all Turnaround and new construction work scopes where temporary construction elevators are required
- 2.2 Situations requiring the installation of temporary elevators may include:
- 2.2.1 Larger/longer Turnarounds for movement of equipment/materials/personnel where space and access are limited
 - 2.2.2 New construction projects while permanent structures and elevators are incomplete.
 - 2.2.3 Demolition projects

3.0 Procedure

3.1 Selection

- 3.1.1 Prior to procurement, during the planning phase a pre-bid meeting shall be held with the, Owing Department, TAR group, Engineering, and elevator vendors to discuss requirements and equipment specifications.
- 3.1.2 During the pre-bid meeting the proposed unit and area will be walked down to evaluate site specific concerns and any possible changes to previous installations.
- 3.1.3 Elevators shall be rack and pinion type. Hydraulic, pneumatic and "traction" styles shall not be used.
- 3.1.4 Elevators shall be VFD (Variable Frequency Drive), and operator control panels shall be keyed so that elevator controls can be turned off when unattended.
- 3.1.5 Elevators that are of the design that does not require a counterweight shall be considered. (Counterweights pose a significant "caught between – struck by" hazard).
- 3.1.6 Where counterweights will be required due to the need for higher capacity elevators a two part protective enclosure fence shall be erected, and a safe access plan shall be incorporated in the site safety plan, to ensure workers cannot access areas while counterweights are in movement.
- 3.1.7 Elevators shall be regulated/limited/buffered to < 195' per minute, with an ideal max speed of 150' per minute.
- 3.1.8 Consideration shall be given to designs that limit the requirement for the use/need for personal fall protection during assembly and disassembly.
- 3.1.9 Preference shall be given to designs that are rated for use in Class 1 Div. 2 classified areas, elevators that are not rated will need to be de-energized and isolated while process units are in operation and permitted as hot work unattended when in service.
- 3.1.10 Roof access to car shall be protected by a standard guardrail consisting of top rail, midrail and toe board.
- 3.1.11 Shall incorporate a manual override for lowering the carriage, in case of power loss,

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consideration shall be given to selection of elevators that incorporate push button override in their design.

- 3.1.12 Elevators for continuous use in or adjacent to operating units, shall be classified for hazardous locations, and permitted as hot work non-attended.
- 3.1.13 Shall be marked with weight and capacity on "every" landing platform and at ground level, and be indelibly stamped inside elevator on specifications placard.
- 3.1.14 Shall be adequately lit/illuminated inside and at platform landings
- 3.1.15 Shall be installed with locking platform doors that cannot be opened from the outside
- 3.1.16 Capacity for personnel and single or double car designs should be considered to accommodate work flow.
- 3.1.17 Cable and pulley designs shall incorporate features that minimize the potential for wrapping or overlay that could interfere with safe operation.
- 3.1.18 An intercom system or buzzer call system shall be considered.
- 3.1.19 All temporary elevators and their installations shall comply with ANSI/ASSE A10.4.
- 3.1.20 All temporary elevators shall require a MOC in accordance with GBR-HESS-PS-10.0 MOC/PSSR Site Procedure.

3.2 Site Preparation

- 3.2.1 An engineered design and drawing(s) (Signed/stamped by Texas PE) shall be developed and/or submitted as part of the proposal and bid process, for approval by GBR Engineering Department. Connection points and locations shall be defined on the final approved drawings. Base loading in pounds per square foot (including max loading capacity) shall be defined. Load calculations for tie in points shall be defined.
- 3.2.2 If scaffolding is to be used for attachment points, connections, or loading it shall have engineered drawings developed and submitted for approval also.
- 3.2.3 The elevator base placement area shall be evaluated by the appropriate Engineering group to determine adequate soil and ground conditions.
- 3.2.4 A formed concrete or reinforced steel base shall be designed and constructed to adequately support elevator weight plus any potential loads.
- 3.2.5 Structural reinforcements, modifications and alterations shall be approved by GBR Engineering Department and verified as complete prior to being released for elevator installation.
- 3.2.6 A mechanical contractor (not elevator vendor) will be assigned the work for preparation of access platforms, including scaffold barrier installation, handrail removal, wall or structure demolition, platform landing door and side wall installation, and/or structural support – reinforcement, and removal (if required) at job completion.
- 3.2.7 Doors and barriers must meet fall protection and standard barrier requirements.
- 3.2.8 The mechanical contractor shall maintain these areas and protect all fall hazards in accordance with the GBR Scaffolding and Fall Protection procedures, until the vendor makes final installation and during disassembly.
- 3.2.9 A dedicated 480v 100-150a service (or as required) shall be identified by tagging the system and placing signage. GBR Electricians shall make all connections to equipment.

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- 3.2.10 Generators (Least desirable source of power) used for supplying power to elevators shall only be used for elevator; no other equipment may be connected.
- 3.2.11 For sites that have had elevators installed previously the appropriate Engineering and Inspection group shall ensure that the connection points (bolted or welded) and elevator base have been inspected and approved for re-use.
- 3.2.12 For new installations the appropriate Engineering and Inspection group shall ensure that the structure is safe for use prior to being placed in service.
- 3.2.13 For elevators that are on site but have been dormant or out of service for more than 30 days the vendor shall be required to perform a comprehensive inspection and tested in accordance with ANSI/ASSE A10.4 and the manufacture's requirements prior to reinstating the elevator into service.
- 3.2.14 An access platform shall be constructed, and designed/rated for potential loading.
- 3.2.15 The travel path of car and structure shall be cleared of all obstructions e.g. scaffolding, cable/cords

3.3 Fall Protection

- 3.3.1 All fall hazards greater than 4' shall be protected by a standard guardrail consisting of handrail, midrail, and toe board.
- 3.3.2 All contractors involved in the assembly, disassembly and maintenance of temporary construction elevators shall utilize adequate fall protection when working above 6', where there is a fall hazard present.
- 3.3.3 100% tie-off will be maintained at all times.
- 3.3.4 A fall protection plan and JSA/JSA for assembly/disassembly shall be required for review and approval by the GBR Safety Department prior to mobilization.
- 3.3.5 If climbing bracing is proposed in plan for assembly a double leg retractable and suitable anchorage device shall be utilized. Documentation of rating for bracing shall be supplied in fall protection plan.
- 3.3.6 Positioning hooks shall be used when workers stop climbing, for assembly.

3.4 Barricading

- 3.4.1 Where openings in fixed structure walls or handrails must be made, a temporary scaffold must be erected in front of the opening, prior to opening/removal and during platform landing door and sidewall installation; to prevent unauthorized persons from accessing potential fall areas and the following signage must be posted at all access points:

DANGER - FALL HAZARD

100% TIE OFF REQUIRED

BEYOND THIS POINT

- 3.4.2 The barricade must also have a tag designating the date and time erected, who the installer was, and the responsible person and contact information.
- 3.4.3 The GBR Maintenance Supervisor is responsible for ensuring these areas are adequately protected.
- 3.4.4 Areas around elevator base must be barricaded during assembly and disassembly, signage must be placed stating:

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DANGER – OVERHEAD WORK

DO NOT ENTER

3.5 Assembly and Disassembly

- 3.5.1 During assembly and disassembly the competent person shall be present at all times.
- 3.5.2 A Safe Work Permit and daily JSA will be required during assembly and disassembly.
- 3.5.3 When practical/possible, the same crew should be dedicated to the erection and dismantling until complete.
- 3.5.4 Area for assembly shall be adequately barricaded. Once the elevator base is set, and power connected, the vendor supplied fencing shall be installed. Counterweights shall require an independent second set of fencing.
- 3.5.5 Once equipment is energized and during assembly/disassembly the ground person/spotter will be posted at the enclosure access door to prevent unauthorized access and the doors shall be locked when unattended.
- 3.5.6 Protective barriers that extend 2' 6" beyond each side and above access doors shall be placed at each landing platform, to prevent employees from coming in contact with moving parts.
- 3.5.7 Adequate bracing/tie-backs shall be installed, at engineering approved tie in locations, every 30' not to exceed 34'.
- 3.5.8 At no time during assembly or disassembly can the hoist be greater than 30' above the tie in point.
- 3.5.9 During assembly and disassembly a spotter or ground person shall be present at all times. Spotter shall have a radio to communicate with installers.
- 3.5.10 When connections are made and fall hazards have been eliminated the installer must contact the mechanical company for barrier removal. Prior to disassembly the installer must contact the mechanical company to have the barriers reinstalled and/or permanent structures replaced.
- 3.5.11 During assembly the load rating and capacity placard shall be posted at every landing platform and at ground and upper elevation(s) by vendor.
- 3.5.12 After assembly a comprehensive inspection shall be performed by vendor and GBR engineering, and a turnover package including daily/weekly/monthly inspection forms, and documentation of vendor supplied training documentation, documentation of Acceptance testing, and detailed inspection reports in accordance with ANSI/ASSE A10.4 shall be delivered to the GBR Maintenance Supervisor.
- 3.5.13 An extinguisher shall be installed inside of the car, by MPC or contractor prior to use.
- 3.5.14 Where there is a potential for falling objects overhead protection must be provided at landings.
- 3.5.15 An overhead protective barrier, to protect workers from dropped objects shall be constructed at ground level and shall extend out far enough to protect workers.

3.6 Use

- 3.6.1 A safe work permit shall be issued and posted in the car.
- 3.6.2 Operator shall perform and document a pre-use inspection on the vendor supplied form,

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prior to beginning the shift, and post it inside the car.

- 3.6.3 The safety interlocks must be inspected daily, and not be overridden.
- 3.6.4 The operator shall visually verify that the travel path of the car is clear and free of obstructions at the beginning of each shift
- 3.6.5 Elevators shall not be loaded beyond the stamped and rated capacity.
- 3.6.6 Mobile equipment shall not be transported in elevators without prior approval by Maintenance Supervisor after verifying the equipment weight (including load) and evaluating the need for use of mobile equipment above grade. (Contact the GBR Safety Department with any questions/concerns). Mobile equipment to be transported by elevator shall be dismounted and in the off position. Mobile equipment shall be accompanied by the elevator operator; no other personnel shall be permitted.
- 3.6.7 Elevator operators shall be supplied with a GBR two way radio to be able to communicate with the SOC and receive any emergency broadcasts. They will be shown where to charge radio and change batteries.
- 3.6.8 If the operator must leave car/controls unattended for any reason the e-stop must be engaged and the elevator controls de-energized by removing the key. The operator shall maintain exclusive control of key.
- 3.6.9 Operator shall ensure that all employees are clear of moving parts, keep their hands and bodies inside of protective barriers/car, and do not place fingers through openings in gates/doors.
- 3.6.10 The operator shall ensure that the elevator is level with the landing platform and doors are fully open before allowing access/egress.
- 3.6.11 Occupants shall not stand on materials that are being transported.
- 3.6.12 Elevators shall not be operated in inclement weather or during lightning alerts. Elevator use shall be discontinued when wind gusts reach 35 mph or sustained winds reach 25 mph, and will not resume until they are below threshold for 20 consecutive minutes.
- 3.6.13 In preparation for high winds or hurricanes the car shall be raised high enough to avoid flood/water damage. The operator shall take the car to the landing between the first and second levels and the e-stop will be engaged, and the elevator shall be de-energized and locked out. Alternatively, follow elevator vendor/owners recommendations for safe off during high winds or hurricanes.
- 3.6.14 Workers shall never operate elevators or open and close doors, only qualified operators
- 3.6.15 In the event of an emergency requiring a localized or plant wide evacuation, the operator shall lower the car to the next floor, engage the e-stop, and all employees shall exit the car and proceed to evacuation/muster points. In case of a localized evacuation the MPC Servicing Group Supervisor in conjunction with the GBR ERT and unit Owning Department can authorize the elevator to continue operation to facilitate evacuation from structure.
- 3.6.16 In case of loss of power or equipment failure the operator will contact the SOC and MPC Servicing Group Supervisor, who will contact the vendor for support.
- 3.6.17 Workers shall never exit the car between landings unless in case of emergency and only when directed by the GBR ERT, and only with adequate fall protection.
- 3.6.18 The MPC Servicing Group Supervisor in conjunction with the GBR ERT shall assess the

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reason for car movement failure and will walk every floor to check door safety interlock switch (if present) position/condition prior to beginning lowering or rescue procedures. (Bent limit switches are the most likely cause of failure). If rescue is determined to be necessary the GBR site rescue plan shall be followed.

- 3.6.19 Elevators may be de-energized and locked out of service for a prolonged time without being disassembled to be left in units for upcoming work but must be re-inspected prior to being placed back in service. (See 3.2.13)
 - 3.6.20 Areas directly in front of and to each side of access platform doors shall be kept free of debris and material for 6'. A clear path of access to and from platforms shall be maintained.
 - 3.6.21 Materials shall be removed from elevators immediately, no storage is permitted.
 - 3.6.22 Any adjacent work that will be performed inside of the travel path or in close proximity will require the elevator to be de-energized and locked out.
- 3.7 Repair, Inspection, Service and Maintenance
- 3.7.1 Any elevator found defective shall be taken out of service and signage placed at all landing platforms and at ground/upper elevations.
 - 3.7.2 Elevator cars, doors, and surfaces shall be free from sharp edges that pose a hazard to occupants.
 - 3.7.3 All repair and troubleshooting activities will comply with GBR-HESS-PR-14 Energy Isolation procedure, and in compliance with RSP-1162 Electrical Safety Work Practice.
 - 3.7.4 Only qualified persons may work on or near energized electrical equipment. Such persons shall be trained and capable of working safely on or near energized circuits and shall be familiar with the proper use of special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools.
 - 3.7.5 A daily elevator inspection checklist shall be completed by the designated operator and be kept in the car at all times. All noted deficiencies shall be immediately reported to the MPC Servicing Group Supervisor.
 - 3.7.6 Only trained and authorized persons (specifically authorized by vendor) shall make repairs to elevators. A documented inspection shall be performed by the vendor after any repairs are made, before elevator is returned to service.
 - 3.7.7 Prior to entry in to the fenced area the e-stop will be engaged, equipment de-energized and 480v panel/breaker locked out. If power is then needed for lowering car, personnel shall be cleared from any pinch points, enclosure exited and closed and power shall then be restored.
 - 3.7.8 Regular maintenance shall be performed weekly by the vendor or other qualified person. The vendor shall perform a monthly inspection. The required periodic inspection and tests shall be performed every 3 months by the vendor and documented; proof of this test shall be supplied to MPC Servicing Group Supervisor, prior to placing elevator back in service. Periodic inspections and tests will be conducted in accordance with ANSI/ASSE A10.4 and the manufacture's requirements.
 - 3.7.9 Maintenance and inspection will be scheduled for "shift change", and contract personnel shall be notified of temporary interruption of service. Signage shall be posted at every landing platform prior to shutdown.

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3.7.10 The MPC Servicing Group Supervisor and/or vendor shall notify the GBR Safety Department when servicing or repair will take place.

3.7.11 An inspection checklist shall be completed by the competent person at the time of inspection and submitted to the MPC Servicing Group Supervisor for the Owning Department, who shall forward it to the GBR Safety Department.

3.8 Training

3.8.1 All personnel who are required to use the elevators must be trained on the safe use and hazards.

3.8.2 Only trained, qualified, and competent operators shall operate elevator.

3.8.3 On site ERT and/or equipment operator shall be trained in the emergency override and lowering controls by vendor. Sufficient trained rescue personnel shall be on site at all times elevators are in use.

3.9 Rescue Plan

3.9.1 The vendor/contractor/installer shall supply equipment specific information and help the GBR ERT to develop an onsite rescue plan, the plan shall be submitted to the GBR Safety Department for evaluation and pre-approval before use of the elevator can be permitted.

3.9.2 Once notified by SOC the GBR ERT will respond and assess the need for rescue, and if determined necessary the site rescue plan will be followed.

4.0 **Definitions**

None

5.0 **References**

5.1 ANSI/ASSE A10.4, "Personnel Hoists and Employee Elevators on Construction and Demolition Sites American National Standard for Construction and Demolition Operations" (Superseded ANSI A10.4, "Safety Requirements for Personnel Hoists")

5.2 ASME A17.1, "Safety Code for Elevators and Escalators Includes Requirements for Elevators, Escalators, Dumbwaiters, Moving Walks, Material Lifts, and Dumbwaiters With Automatic Transfer Devices"

6.0 **Attachments**

None

7.0 **Revision History**

Revision Number	Description of Change	Written by	Approved by	Revision Date	Effective Date
0	Original Issue. Supersedes GBR-HESS-PR-22.	T. Brown	J. G. Montminy	12/18/2018	12/18/2018