

Task or Employee: AEG Field Core Functions (Rev. 6)

Routine

Non-routine

Retention: Completed Routine JHAMs are retained by the employee and supervisor. Non-routine JHAMs are retained until the task is fully closed out. In the case of an accident, the form is to be retained for use by the review team.

Complete instructions and supporting information is available at <https://www-internal.slac.stanford.edu/esh/SLACsafety/jham/>. Enter information into boxes which will expand to accommodate whatever length of text is entered. Once this JHA is complete, all participants should sign in the Acknowledgement section. Add rows by placing cursor in the right box of the last row and entering a tab.

Sequence of Basic Job Steps	Potential Hazards	Controls & Recommended Actions
<p><u>Loading Equipment from Alignment Lab and Storage Areas to Trucks or Vans:</u></p> <p>Moving of heavy and sometimes awkward equipment for an upcoming survey job. Equipment includes:</p> <ul style="list-style-type: none"> ▪ Survey instruments (tracker, total station, level, etc.) ▪ Instrument stands (metal or wood) ▪ Leveling rods (up to 3m length) ▪ Cart (computer, power reel, etc.) ▪ Reflectors and targets ▪ Tools and tool bag. 	<ul style="list-style-type: none"> ○ Back injury or strain ○ Crushing or pinching of hands and fingers ○ Crushing of feet 	<ul style="list-style-type: none"> ○ Use proper lifting techniques. Ask for help or assistance when moving heavy or awkward objects ○ Push rather than pull heavy objects ○ Wear appropriate shoes and gloves when necessary ○ Break down equipment to make lighter and use appropriate carrying cases for transport <p>Training:</p> <ul style="list-style-type: none"> ○ <i>Personal Protection Equipment (PPE) (Course 255)</i>
<p><u>Transporting Equipment to Job Site:</u></p> <p>Operating vehicles including vans, trucks, cars, electric carts and towing trailers.</p>	<ul style="list-style-type: none"> ○ Accident ○ Dropping of loads ○ Falling off vehicle 	<ul style="list-style-type: none"> ○ Only licensed drivers should operate a motor vehicle ○ Obey all traffic rules ○ Stack all equipment in a secure manner within vehicle ○ Secure unsteady or unbalanced loads in or on vehicles ○ Use safety chain for towed items

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		<ul style="list-style-type: none"> ○ Use hand-truck as alternative method of transferring gear from vehicle to job site. <p>Training:</p> <ul style="list-style-type: none"> ○ <i>Valid Driver's License</i>
<p><u>Unloading and Transporting Equipment at Job Site:</u></p> <p>Unloading of survey equipment as described above. Some areas such as the damping rings or linac require the use of cranes to transport equipment and the use of stairs or ladders for access. Occasionally jobs may require the use of a forklift or electric cart.</p>	<ul style="list-style-type: none"> ○ Back injury or strain ○ Crushing or pinching of hands and fingers ○ Crushing of feet ○ Accident in cart or forklift ○ Dropping of loads damaging equipment or injuring people ○ Falling off vehicle ○ Falling down stairs or off ladder ○ Head injury ○ Rigging can give or break causing injury to bystanders 	<ul style="list-style-type: none"> ○ Use proper lifting techniques and ask for help if needed ○ Push rather than pull heavy objects ○ Wear appropriate shoes and gloves when necessary ○ Break down equipment to make lighter and use appropriate carrying cases for transport ○ Forklift training required for operators ○ Obey all traffic and safety rules ○ Stack all equipment in a secure manner within vehicle or on the forklift ○ Secure unsteady or unbalanced loads in or on vehicles and forklift ○ Keep within load limit of equipment ○ Inspect equipment and rigging before use ○ Ask for dedicated riggers to help on challenging tasks ○ Make sure personnel in area wear head protection if appropriate ○ Ladder safety (see section below) ○ Be aware of stair hazards such as keeping shoe laces secure and taking care with wet and/or slippery stair surfaces ○

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		<p>Training:</p> <ul style="list-style-type: none"> ○ <i>Personal Protection Equipment (PPE) (Course 255)</i> ○ <i>Basic Crane Operations and Rigger Training (Course 280)</i> ○ <i>Forklift Operator Training (Course 283)</i> ○ <i>Stairway and Ladder Safety (Course 293)</i>
<p><u>Job Site Survey:</u></p> <p>Entering possible radiological areas.</p> <p>Setting up surveying instruments, placing reflectors and other targets around area sometimes requiring the use of ladders or climbing over magnets, connecting computer(s) and power supply, placement of illumination if necessary.</p> <p>Adjustment of measured components such as magnets if necessary using non-powered hand tools such as wrenches.</p> <p>Movement of instruments for next set-up, rotating targets, changing illumination.</p> <p>Occasionally encountering the following:</p> <ul style="list-style-type: none"> ▪ drilling new monuments using power tools such as hammer drills and also non-powered tools ▪ Use of hazardous materials such as epoxy for gluing targets or marking 	<ul style="list-style-type: none"> ○ Exposure to radiation ○ Falling off ladders or elevated surfaces (see “Fall Protection” details in the Controls column) ○ Exposure to electrical energy ○ Electrical burns ○ Tripping over cords, obstacles and uneven surfaces ○ Cuts, stab wounds and eye injuries from powered and non-powered hand tools. ○ Electrical shock from power tools ○ Particles flying into eyes and inhalation of dust from drilling ○ Exposure to hazardous materials through eyes, skin and inhalation ○ Improper disposal of hazardous materials ○ Bumping into objects with head or body ○ Getting in the way of other workers ○ Lack of proper breathing atmosphere (asphyxiation) in confined spaces 	<ul style="list-style-type: none"> ○ Follow all radiological signage ○ Inspect ladders before use and don’t use damaged ones. Use the right ladder for the right job ○ Zone off area if there is a potential for falling objects <p>Fall Protection:</p> <ul style="list-style-type: none"> ○ Use fall protection when working on elevated surfaces (above 4 feet in height and within 6 feet of edge). Ensure the equipment is inspected by a SLAC competent person twice annually and before use ○ Before each use, read safety tags (which can only be marked by a SLAC competent person), inspect harnesses, lanyards, self-retracting lifelines, and connecting hardware for wear, damage, contamination, and other deterioration according to manufacturer’s instructions and checklists (see ES&H’s <u>Forms & Tools</u> for manufacturers' pre-use checklists). Equipment not meeting inspection criteria will immediately be tagged “Danger – Out of Service” and will not be used ○ Prior to an authorized person working on an elevated surface, establish a work procedure via an Elevated Surface Work Plan (<u>ESWP</u>). <u>Have an ES&H competent person develop and/or approve the</u>

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<p>surfaces using spray paint</p> <ul style="list-style-type: none"> ▪ Entering tight or confined spaces such as for working on the linac laser ▪ Working around magnets and other equipment with possible electrical power ▪ Working in warm environments ▪ Working in noisy environments 	<ul style="list-style-type: none"> ○ Dehydration ○ Loss of hearing 	<p><u>plan along with approval by the building manager.</u> (The ESWP will address the associated fall hazards. It also includes a rescue plan if fall arrest systems are in use)</p> <ul style="list-style-type: none"> ○ A Fall Protection Plan (FPP) must exist when conventional fall protection (guardrails, fall arrest or restraint equipment, safety nets) are impractical or more dangerous for working on an elevated surface: <ul style="list-style-type: none"> ▪ FPP's are kept at the job site and are similar in function to an AHA. It is approved by a SLAC division director or higher only ▪ If there is no FPP available at the job site, and you believe the job may require it, bring this to the attention of the SLAC competent person and the building manager. <u>DO NOT START THE WORK until authorized to do so by the competent person</u> <p><i>Notes:</i> <i>The FPP is created by a designated SLAC qualified person and the plan must be implemented only under the supervision of a SLAC competent person (i.e. the AEG does not create this document but must follow it if applicable). The FPP will identify locations where conventional fall protection methods cannot be used and will designate these locations as controlled access zones (CAZ), and will identify each employee allowed to work in the CAZ</i></p> <ul style="list-style-type: none"> ○ Have someone hold the ladder if needed ○ Position ladder away from doors or other potential hazards ○ Store ladders so that they do not block exits in the event of an earthquake ○ Talk to area managers before working in areas with power sources ○ Apply lock and tag procedures

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		<ul style="list-style-type: none"> ○ Verify equipment is de-energized (need further guidance) ○ Don't rush. Assess potential trip hazards and secure power cords away from traffic ○ Wear gloves when practical ○ Use liquid wrench or similar product to pre-loosen tight bolts ○ Inspect power tool and cords for wear and damage. Don't use equipment with damaged power cords ○ Use GFCI on extension cords ○ Do not "daisy chain" extension cords/power strips ○ Wear safety glasses, preferably with side shields. Consider also hearing protection when drilling. ○ Consider the use of a dust mask for drilling or even spray painting ○ Read and understand the Material Safety Data Sheets (MSDS) for hazardous materials such as epoxies and glues. ○ Properly dispose of hazardous waste taking extra consideration in potentially radiologically contaminated areas ○ Wear a hard hat or bump hat if necessary ○ Practice good housekeeping especially in tight areas ○ Be aware of your surroundings and communicate with other workers ○ For confined spaces, contact ES&H personal to obtain confined space entry permit. Follow all requirements and rules ○ In warm areas drink plenty of water. Bring water sources provided in fridge to job site. Rest if you feel dizzy and hydrate as soon as possible ○ In noisy areas wear hearing protection whenever possible ○ Wear hearing protection in areas defined as "hearing protection required"

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		<p>Training:</p> <ul style="list-style-type: none"> ○ General Employee Radiological Training (GERT) (Course 115) for RCA's ○ Radiological Worker Training I (RWT I) (Course 116) for High Radiation Areas ○ Radiological Worker Training II (RWT II) (Course 250) for Contamination Areas ○ Stairway and Ladder Safety (Course 293) ○ Fall Protection Training (Course 200) ○ Lock and Tag Program for the Control of Hazardous Energy (Course 157) ○ Electrical Safety for non-electrical workers (Course 239) ○ Electrical Safety for R&D Equipment (Course 251) for equipment at or above 50V ○ Permit-Required Confined Space Safety (Course 144)
<p><u>Packing Up and Leaving Job Site:</u></p> <p>See above for loading and transporting equipment back to alignment lab and storage areas.</p>		
<p><u>Alignment and Calibration Laboratories:</u></p> <ul style="list-style-type: none"> ▪ use of hand tools (non-powered) such as wrenches, hammers, saws and screw drivers ▪ soldering ▪ use lasers ▪ earthquake 	<ul style="list-style-type: none"> ○ puncture wounds / cuts ○ eye injury ○ burns ○ inhalation of fumes ○ falling objects / blocked doorway (only one exit) in the calibration laboratory 	<ul style="list-style-type: none"> ○ use Personal Protection Equipment (PPE) when necessary such as gloves, safety glasses and steel-toed boots ○ apply force away from body when prying ○ use protective holder to store heated soldering iron ○ properly dispose of solder dross ○ solder in well ventilated area

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		<ul style="list-style-type: none"> ○ follow AEG laser guidelines: http://www-group.slac.stanford.edu/met/Align/Safety/Laser_List.xls ○ make sure phone communication is working and be sure someone is informed that you are working in the calibration laboratory
<p><u>Entering Construction Sites:</u></p> <ul style="list-style-type: none"> ▪ situations when a construction site is being visited 	<ul style="list-style-type: none"> ○ exposure to various construction activities and other hazardous situations: <ul style="list-style-type: none"> ▪ excavations ▪ tunneling ▪ large equipment ▪ scaffolding ▪ working at heights ▪ hand tools / power cords 	<ul style="list-style-type: none"> ○ Plan and discuss scope of visit with appropriate area or building manager and safety officer. Announce entry and inform of presence. <ul style="list-style-type: none"> ▪ observe and follow safety signs (e.g., “wear safety glasses in this area”, “close-toed shoes required”, “hard-hat area”) ▪ be aware of surroundings
<p><u>Entering Research Areas, Shops, and Experimental Facilities:</u></p> <ul style="list-style-type: none"> ▪ situations when a research area, shop or experimental facility is being visited 	<ul style="list-style-type: none"> ○ exposure to all the work activities that are being performed in the area such as: <ul style="list-style-type: none"> ▪ moving machinery ▪ trips ▪ flying chips/metal ▪ weld flash ▪ crane hazards ▪ electrical hazards 	<ul style="list-style-type: none"> ○ Plan and discuss scope of visit with appropriate area or building manager and safety officer. Announce entry and inform of presence. <ul style="list-style-type: none"> ▪ observe and follow safety signs ▪ respect barricades and postings ▪ do not touch anything unless sure it is ok to do so ▪ be aware of surroundings

Acknowledgements	Print Name	Signature or Initialed	Date
Supervisor:	Catherine LeCocq		
Participants:	Brian Fuss		
	Georg Gassner		
	Francis Gaudreault		
	Mike Gaydosh		
	Levirt Griffin		
	Hans Imfeld		
	Miho Matias		
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	Michael Perry (subcontractor)		
	Bob Pushor		
	Mike Rogers		
	Bryan Rutledge		