

OLCF SUBCONTRACTOR/VENDOR HAZARD ANALYSIS

Project/Task: Subcontractors and Vendors to receive, Install and Maintain NCCS Systems in NCCS Centers.	Issue Date: 05/15/19 R0
Approved By: Paul Abston <small>(Supervisor, ETC)</small>	Prepared By: Paul Abston
Location: ORNL Buildings 5600 and 5600 Annex	Other Applicable Documents: None
Job Description: Receive, Unpack, Install, Troubleshoot, Repair, and Maintain NCCS Systems (Subcontractors and Vendor Work)	
Special Precautions or Instructions: <ul style="list-style-type: none"> • All employees have Stop Work Authority and shall exercise their Stop Work Authority anytime they perceive an unsafe condition for themselves, co-workers, other groups in the area or a hazard to the environment or facility. • Employees shall listen to and abide to all ORNL Announcements. • Immediately report all injuries/accidents/events to the Operations Control Room (OCR) 865-574-5310 or the Laboratory Space Manager: Paul Abston (865) 241-0355 or (865) 250-5469 	
PPE Requirement(s): <ul style="list-style-type: none"> • Safety Glasses (When Eye Hazards Persist, See Controls) • Hard Toed Safety Shoes (Required when there is a possibility of a load being dropped on foot.) • Leather or other cut resistant gloves are required for handling sharp tools, materials with sharp edges, wood pallets. • Hearing Protection – as required by task and noise level. See center door posting for room requirement. 	
Tools: <ul style="list-style-type: none"> • Hand Tools (ratchets, sockets, pliers, wrenches, utility knives, etc) • Power tools: impact driver, Drill • Ladder and Step Stools • Material Handling Equipment (Pallet Jacks, Dollies, Server Lifts, etc) 	
Training Requirement(s): <ul style="list-style-type: none"> • ORNL Access Training. • Lock/Tag/Verify (As Required) (LO/TO training for Subcontractors/Vendors shall be in accordance with their company's procedure. When Subcontractor/Vendor does not have a procedure, ORNL Lock/Tag/Verify training shall be taken.) • Authorized Access to ORNL Computing Centers (as required for unescorted access to centers) 	

NCCS SUBCONTRACTOR/VENDOR HAZARD ANALYSIS

Job Steps	Potential Hazards	Control Measures
1) All Tasks/steps	<ul style="list-style-type: none"> Spill, water, leak, injury or other upset condition 	<ul style="list-style-type: none"> Place area in safe condition. Exit the area and report to the OCR or LSM. For severe injuries or fire call the Laboratory Shift Superintendent (LSS) 865-574-6606 or 911 from a landline. Do not jeopardize your own safety in attempt to control the condition.
	<ul style="list-style-type: none"> Facility/Plant event 	<ul style="list-style-type: none"> Listen to and obey LSS or Plant announcement/directions. The assembly point is located North of building 5600 across the grass quad. Understand Shelter-In-Place and know the Take Cover location.
	<ul style="list-style-type: none"> Hazards requiring PPE 	<ul style="list-style-type: none"> The minimum clothing/PPE shall be short sleeve shirts, long trousers, and closed toe sturdy shoes. Additional PPE (hardhats, gloves, safety glasses, boots/shoes with protective toes, etc.) will be required based upon the task and hazards. Seller shall evaluate their work and assess the workplace to determine hazards and PPE.
	<ul style="list-style-type: none"> Hazards present in the room or center but not task related 	<ul style="list-style-type: none"> Work in the centers requires escort or Authorized Access to ORNL Computing Centers training.
2) Receive Components (Includes, receive from truck, unbox, remove from crate, remove from pallet, roll into the room, position and install racks including mounting to each other, lowering legs, and installing kick plates.)	<ul style="list-style-type: none"> Striking Pedestrians and Traffic Hazards 	<ul style="list-style-type: none"> Flagman wearing reflective vests and utilize flags shall be used to block traffic and the side walk when backing a truck up to the dock. If a lane closure is required, the LSS shall be notified prior to closing of the lane at (865-574-6606). In addition, flagman with vests and flags will be required for vehicle and foot traffic control until the lane is re-opened. Be visible and located where drivers can see you.
	<ul style="list-style-type: none"> Strains/sprains 	<ul style="list-style-type: none"> Get help with lifting and holding heavy materials. Use material handling equipment (pallet jacks, server lifts, lift tables, etc.) Follow manufacturer's directions and inspect equipment prior to use. Use team lifting to get items from pallets to carts. Use the ramps for rolling racks off the pallet
	<ul style="list-style-type: none"> Caught In-between 	<ul style="list-style-type: none"> Be aware of backing trucks and stay in the driver's view. Do not get between a motorized pallet jack and other obstructions.
	<ul style="list-style-type: none"> Blocked Exits 	<ul style="list-style-type: none"> Coordinate any loading/storage/staging with the facility. Keep corridors passable and do not store materials in the stairs. Do not wedge or block open doors leading to stair enclosures.
	<ul style="list-style-type: none"> Cuts 	<ul style="list-style-type: none"> Wear leather gloves or other cut resistant gloves when handling sharp materials or cutting tools. Always cut away from your body. Use safety self-retracting utility knives unless the task requires a manual retracting. Use gloves when handling components with sharp edges. Gloves are required when handling metal banding.

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	<ul style="list-style-type: none"> Splinters/punctures 	<ul style="list-style-type: none"> Wear leather or other approved gloves when handling pallets.
	<ul style="list-style-type: none"> Slips/Trips 	<ul style="list-style-type: none"> Practice good housekeeping in the area. Be aware of your path. Avoid walking backwards.
	<ul style="list-style-type: none"> Combustible Hazards 	<ul style="list-style-type: none"> All combustible materials shall immediately be removed from the facilities and placed in the appropriate storage locations/bins outside the facility. Cardboard, packing materials and pallets ARE NOT allowed in the data centers.
	<ul style="list-style-type: none"> Striking Building Occupants 	<ul style="list-style-type: none"> Be aware of on-lookers. Barricade areas as necessary. Use a spotter (as necessary) when moving large items from dock to staging or staging to the room. Coordinate any storage in the hallway adjacent to the loading dock with facility management. Erect and maintain barricades with postings.
	<ul style="list-style-type: none"> Hazards from defective material handling equipment or misused equipment 	<ul style="list-style-type: none"> Inspect all equipment prior to use in accordance with manufacturer's directions. Remove any defective equipment from service. Only personnel familiar with the safe use and operation of material handling equipment shall operate the equipment.
	<ul style="list-style-type: none"> Cuts from Sharp Edges 	<ul style="list-style-type: none"> Be aware of potential sharp edges with metal cabinets. Wear leather or cut resistant gloves. Remove any sharp edge or identifies metal burrs.
	<ul style="list-style-type: none"> Hazards from tools 	<ul style="list-style-type: none"> Inspect all tools prior to use. Remove defective tools from the work area. Use the proper tool for the task. Avoid multi-purpose tools and adjustable wrenches. Use the tool as intended by the manufacturer. Workers shall ensure they are knowledgeable of hand and power tool use and all tools shall be fitted with applicable guards and safety switches. Tool use may require additional PPE such as gloves, safety glasses, and hearing protection. Safety glasses are always required when using power tools.
	<ul style="list-style-type: none"> Noise 	<ul style="list-style-type: none"> Hearing protection may be required when using power tools. A good rule of thumb to determine the need for hearing protection is if you have difficulty hearing or understanding a "normal" tone of voice at a distance of about three feet. Any sawing or drilling of metal cabinets will require hearing protection. ORNL may perform noise level surveys to verify safe levels are maintained in the room. Workers working in areas where the noise levels and work duration exceed ACGIH guidelines shall be enrolled in a Hearing Conservation Program.
	<ul style="list-style-type: none"> Muscle Strain 	<ul style="list-style-type: none"> Be aware of body positioning especially awkward positioning. Take frequent breaks. Avoid prolonged kneeling, stooping, or other awkward positions.

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3) Install Components	<ul style="list-style-type: none"> Hazardous Energy (electric and water) 	<ul style="list-style-type: none"> Cord and plug equipment may be installed by Subcontractor/vendor. Label both ends of newly installed plug and cords where routing of the cord obscures the safe determination of both ends. ORNL shall make PDU connection to facility power. LO/TO will be provided by ORNL using ORNL procedures. Subcontractor/Vendor, if required to work on the isolated system, will be required to observe and agree to verification of lack of energy and install a personal lock on the lock box. ORNL personnel will ensure that a pre-job briefing is conducted with the seller covering items such as scope, location, equipment status, hazards, procedures, energy sources, PPE, and each party's responsibilities/procedures. If possible, "air gapping, ex: PDU unplugged from facility power" will be utilized to provide lack of energy. ORNL qualified electrical workers shall be responsible for make all non-cord and plug or hard (wire to lug) connections. Only Qualified Electrical Workers can perform electrical work. Subcontractor/vendor SHAL NOT operate facility breakers or disconnects. Subcontractor/vendor SHAL NOT operate facility valves. Protect extension cords from shard edges and in doorways. Use hard or extra-hard rated cords. Cords cannot be used as permanent power source.
	<ul style="list-style-type: none"> Slips, Trips, falls 	<ul style="list-style-type: none"> Practice good housekeeping. Place trash in its proper place
	<ul style="list-style-type: none"> Eye Hazards 	<ul style="list-style-type: none"> Wear safety glasses when pulling cables or cabling racks. Wear safety glasses when using power tools. Wear safety glasses when removing floor tiles for protection from blown dust.
	<ul style="list-style-type: none"> Hazards from other work groups working in the area 	<ul style="list-style-type: none"> Additional hazards from adjacent work in the space will be present. Stay in your assigned work area. Entry into other work areas will require following PPE for that work area, additional HAs, and possible additional training. Be aware of postings. Delineate work areas with barricades and postings.
	<ul style="list-style-type: none"> Muscle Strain from lifting 	<ul style="list-style-type: none"> Practice good lifting techniques. Use mechanical lifting equipment when possible. Follow manufacturer's directions and inspect equipment prior to use. Use team lifting. Follow ACGIH guidelines for safe lifting. Squat and lift with your back straight. Avoid twisting when lifting. Avoid carrying heavy loads. Utilize material handling equipment.

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	<ul style="list-style-type: none"> Fall from a ladder /step stool 	<ul style="list-style-type: none"> Inspect the ladder or step stool prior to use. Follow the manufacturer's directions for use of the ladder. Do not over reach. Keep your body positioned between the rails. Do not ascend or descend with items in your hand. 3 points of contact are required for ascending and descending. Do not exceed the ladder's weight rating. Secure extension ladders before use.
	<ul style="list-style-type: none"> Repetitive lifting hazards (racking multiple servers, rear doors, etc.) 	<ul style="list-style-type: none"> Use a server lift with installations that are "chest height" or higher and for the lower "U"s. Use a cart to move servers to the cabinet. Use good lifting techniques. Seek help when possible, especially when installing from floor to knee height. Follow ACGIH Guidelines for lifting. (Table 1: Up to 2 hrs/day with up to 60 lifts per hour or > 2 hours per day with up to 12 lifts per hour.) Team lift rear doors and use material handling equipment to position for install.
	<ul style="list-style-type: none"> Exposure to Hazardous Energy 	<ul style="list-style-type: none"> Subcontractor/vendor can install plugs/cords to server/node installation is considered as "cord and plug". See Hazardous Energy (electric and water) in Step #2. Contact ORNL LSM for questions.
	<ul style="list-style-type: none"> Caught In-Between (material moves, director switch installation) 	<ul style="list-style-type: none"> Be aware of body positioning. If necessary, scotch the switch to keep it from rolling backwards. Be aware of where you place your hands to prevent caught-in-between / crush between the switch and rack. Communication between co-workers is essential to ensure everyone knows when to push and stop.
	<ul style="list-style-type: none"> Underfloor hazards 	<ul style="list-style-type: none"> Subcontractor/vendor SHAL NOT remove floor tiles except tiles at their cabinet to perform local cabling (cabinet to cabinet). Areas around removed tiles shall be barricaded/conned. Do not crawl under the floor.
	<ul style="list-style-type: none"> Falls (Scaffolding or fall protection equipment) if applicable 	<ul style="list-style-type: none"> Scaffolding will be erected, dismantled, maintained, and inspected by a scaffolding competent person. Scaffolding shall be inspected by the competent person prior to each 12-hour shift. The results shall be documented on scaffold inspection card. Scaffolding platform height is limited to < 4 feet. Scaffold casters shall be locked when personnel are working on the scaffolding. Scaffolding shall be OSHA compliant. Personnel shall be trained in the use of fall protection equipment. ORNL competent person shall approve all anchor points. Equipment shall be inspected by the user prior to use.

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	<ul style="list-style-type: none"> • Cuts from Sharp Edges 	<ul style="list-style-type: none"> • Be aware of potential sharp edges associated with the cable trays. Report any sharp edges to supervision.
	<ul style="list-style-type: none"> • Dropping item on Personnel Below 	<ul style="list-style-type: none"> • Coordinate work to prevent working over/above others. • Minimize storing items on the scaffolding or ladder. • When possible, provide falling object protection to workers working below. • Do not leave loose items on the cable trays or cabinet tops.
	<ul style="list-style-type: none"> • Chemical Hazards 	<ul style="list-style-type: none"> • Chemical use shall be evaluated by the LSM. Cleaners such as window cleaner and alcohols may be permitted and would be low exposure risks.
4) Troubleshoot Components in an Energized Cabinet	<ul style="list-style-type: none"> • Hazardous Energy Exposure 	<ul style="list-style-type: none"> • Any work in an energized cabinet shall require verification of energy isolation (LO/TO), lack of exposed conductors, or that the equipment requiring removal/repair is cord and plug. • Work or troubleshooting, including testing with voltage meters. Is not permitted if above conditions are not met. • Contact the LSM prior to troubleshooting components in an energized cabinet. • Failed cords and plugs that are non-cord and plug or hard (wire to lug) connections shall be disconnected/removed by ORNL qualified electrical worker. • Volt/ohm meters shall not be used by subcontractor/vendor to troubleshoot power. • Cords in a cabinet SHALL NOT be cut or severed by subcontractor/vendor for removal or abandonment. Contact the LSM for assistance! • Never open a component that is connected to the PDU power. Components that have been disconnected from power and placed on a bench can be opened for repair.
	<ul style="list-style-type: none"> • Visibility in cabinets (illumination) 	<ul style="list-style-type: none"> • Poor illumination in cabinets can lead to trouble reading labels or identifying correct components, use auxiliary lighting.
5) Waste/Recycling	<ul style="list-style-type: none"> • Insult to the Environmental 	<ul style="list-style-type: none"> • Recycle and re-use as practical. • Cardboard shall be broken down and placed in the cardboard bin. • Metal goes in the metal bin. • Classification 1 and 2 plastics go in the plastic bins. • Use paper recycle bins for office papers.
	<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •

NCCS SUBCONTRACTOR/VENDOR HAZARD ANALYSIS

	<u>Print Name</u>	<u>Signature</u>	<u>Date/Time</u>
Prepared By:	Paul Abston		
Approved By:	Paul Abston		
Vendor Concurrence:			
	<u>Print Name</u>	<u>Signature/Initial</u>	<u>Date/Time</u>
Employee Name(s):			

NCCS SUBCONTRACTOR/VENDOR HAZARD ANALYSIS

	Print Name		Signature	Date/Time
Employee Name(s):				

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