

Construction Job Safety Analysis

This form must be completed by the construction contractor and submitted to the Project Manager for approval prior to work commencement. In addition, this form must be maintained at the construction site where work is being performed. The scope of work and all MSDSs must be attached to this JSA before it may be reviewed and signed as reviewed.

Project/Job Title _____

Contract Number _____ Building/Area _____

Contractor	Argonne
Contractor _____	Project Manager _____
Project Manager _____	Phone No. _____
Phone No. _____	Alternative No. _____
Alternative No. _____	Construction & Safety Mgr. _____
Foreman _____	Phone No. _____
Phone No. _____	Alternative No. _____
Alternative No. _____	Project Specialist/Tech Rep. _____
ESH Rep _____	Phone No. _____
Phone No. _____	Alternative No. _____
Alternative No. _____	Other _____
Contractor Designated Authorized or Competent Person	Argonne Reviewers
Excavation _____	Division Qualified Employee _____ Date _____
Confined Space _____	Division ES&H Coordinator _____ Date _____
Scaffolding _____	ESQ-SME (as needed) _____ Date _____
Fall Protection _____	FMS-C&SM (as needed) _____ Date _____
NFPA 70E _____	
Additional/Optional SME Reviewers	
SME (as needed) _____ Date _____	<p><i>If FMS is <u>not engaged</u> and the division does not have the qualified employee on staff, the <u>ESQ SME and ES&H coordinator signatures are required.</u></i></p> <p><i>If FMS is <u>engaged</u>, the <u>FMS-C&SM and ES&H coordinator signatures are required.</u></i></p>
SME (as needed) _____ Date _____	
SME (as needed) _____ Date _____	

Project manager must indicate who is identified to review and approve this JSA as the “ESQ-SME (as needed)” signature.

ESQ FMS Division Qualified Employee

Contractor Project Manager Review _____
Name Date

Argonne Project Manager Review _____
Name Date

Phase of Work	Safety Hazard	Controls for Hazards
Use of Hand Tools	Broken or Unauthorized Tools	All tools and equipment must be inspected by Argonne personnel prior to use. This includes tools and equipment brought on site after the project has started. Any tool or piece of equipment deemed unsatisfactory will be tagged and removed. Any tool or piece of equipment that leaves the Argonne site must be re-inspected upon its return. GFCIs must be used on all portable electrical equipment, 125v or less. Extension cords must be at least 14ga.
Using Portable Ladders (e.g., A-frame, straight, or extension)	Falls	Before use, check the load rating of the ladder, to make sure the ladder can support the combined weight of the user, the weight of tools, and the weight of any material that will be placed on the ladder. This includes the weight of anything that may be supported by the user. All portable ladders must be non-conductive (dry wood, fiberglass, resin). Ladders must be inspected prior to each use. Workers using ladders shall not work above the rated working height. All extension ladders will be tied off at the top. Another worker will secure the ladder while it's being tied off.
Delivery of materials or equipment	<p>Gap between delivery vehicle and the dock</p> <p>Stepping off the edge of a tail or lift gate</p>	<p>When utilizing a dock, trucks must be backed to the dock to minimize hazardous gaps.</p> <p>Dock plate or dock levelers must be used to bridge when the gap between the vehicle and the dock creates a hazard for the equipment or materials being transferred.</p> <p>Make shift dock plates/bridges are not allowed.</p> <p>Do not overcrowd the area of the lift gate. Always leave enough room for the employee to safely maneuver themselves and material/equipment being transferred.</p> <p>Working or standing on the tailgate while loading or unloading equipment or material is prohibited.</p>
Welding, Cutting, Brazing, Soldering, Grinding	<p>Fire</p> <p>Sparks Generation</p>	<p>An Open Flame Operating Permit is required before any open flame work may be done.</p> <p>All personnel engaged in welding or cutting job tasks shall wear all industry recognized PPE to protect from burns either to the skin or the eyes. All permit authorized areas need to be permitted for open flame work by Argonne personnel. All workers assigned to the job will review the open flame operating permit.</p>

Phase of Work	Safety Hazard	Controls for Hazards
Welding, Cutting, Brazing, Soldering, Grinding (Cont.)		<p>A 20 lb. ABC fire extinguisher shall be readily accessible and immediately available when any open flame work is performed. Combustibles and flammables must be kept clear of the open flame work area. Fire watches must be trained and competent in the use of fire suppression equipment. Fire extinguishers must be checked monthly. Fire watches must have the means and know to call the Argonne Fire Department in case of an emergency. Fire watches are to remain 30 minutes after completion of open flame work is stopped. Note: Check with Project Specialist/Technical Representative/Point of Contact to determine potential impact to the smoke detection system from open flame work.</p> <p>Oxygen and acetylene cylinders will be stored and secured in an upright position with caps in place with a minimum of 20 feet separation or separated by a noncombustible barrier at least 5 feet high having a fire resistance rating of one half hour except when in an approved cart ready for use. Proper signage regarding “No Smoking” or “Ignition Sources” must be posted.</p> <p>Smoking is only allowed in designated smoking areas.</p> <p>Butane (e.g., Bic) lighters are not allowed to be carried by contractor employees engaged in welding or torch cutting/brazing or soldering operations.</p> <p>All torch set cylinders must have the valves closed and the system de-pressured before going to breaks or lunch.</p> <p>All oxygen/acetylene set-ups must be equipped with flash back arrestors.</p>
Hazardous Energy Sources	Stored energy, Employee Exposure, Electrical Shock	Follow approved Argonne procedure for LO/TO of this system. Argonne will initiate and lock out first; contractor will apply locks over Argonne. The contractor must provide their own locks/tags for each contractor employee for each LO/TO point. Argonne must review and approve proof of contractor LO/TO training before contractor may apply /participate in LO/TO. Zero energy state verification of electrical LO/TO must be performed by a person trained in NFPA 70E and using the required PPE.
Handling of Chemical/Products	Chemical exposure	Submit for review by Argonne personnel, all MSDSs for materials that will be used on site by the contractor. These MSDS(s) must be submitted with this JSA for review prior to approval. Review and adhere to MSDS(s) before handling chemicals/ products. MSDSs must be at the job site attached to the JSA. If additional PPE is prescribed within the MSDS, the contractor must acquire and utilize the additional PPE.
Working at heights at/above 6 feet	Fall Hazards	(fill in if needed)

Phase of Work	Safety Hazard	Controls for Hazards
Working in Confined Spaces	Asphyxiation, Engulfment or Entrapment Fire Explosions Exposure to toxic chemicals	(fill in if needed)
Working with Respirators	Airborne Particulates	(fill in if needed)
Ordinary Lifts (The use of cranes, hoists, forklifts, or chain falls to move, place or lift items)	Dropped load Calculations not computed properly Equipment not inspected Striking overhead electric lines	Coordinate with the FMS Construction & Safety Manager (C&SM) any potential lifts. Follow the Argonne Manual of Construction. On-site crane inspections by Argonne Operation training license/certification Operator medical Third party inspection for cranes. Approved lift plan if needed. Maintain 20-ft. distance from overhead electrical lines and equipment.

Phase of Work	Safety Hazard	Controls for Hazards
<p>Critical Lifts (The use of cranes, hoists, forklifts, or chain falls to move, place or lift items)</p> <p>1. The load item, if damaged or upset, would result in a release into the environment of radioactive or hazardous material exceeding the established permissible environmental limits.</p> <p>2. The load item is unique and, if damaged, would be irreplaceable or not repairable and is vital to a system, facility, or project operation.</p> <p>3. The cost to replace or repair the load item, or the delay in operations of having the load item damaged, would have a negative impact on facility, organizational, or DOE budgets to the extent that it would affect program commitments.</p> <p>4. A lift not meeting the above criteria shall also be designated critical if mishandling or dropping of the load would cause any of the above noted consequences to nearby installations or facilities.</p>	<p>Dropped load</p> <p>Calculations not computed properly</p> <p>Equipment not inspected</p> <p>Disruption of operations or experiments.</p> <p>Environmental releases</p> <p>Striking overhead electric lines</p>	<p>A critical lift plan on an FMS-578 must be submitted to the Argonne Critical Lift Committee for approval prior to any lift. Distances, weights, electrical obstructions underground utilities will be discussed.</p> <p>On-site crane inspections by Argonne</p> <p>Operation training license/certification</p> <p>Operator medical</p> <p>Third party inspection for cranes.</p> <p>Approved lift plan</p> <p>Maintain 20-ft. distance between overhead electrical lines and equipment (cranes & derricks)</p>

Phase of Work	Safety Hazard	Controls for Hazards
Lasers	All lasers have the potential for eye injuries.	<p>Only class 2, class 3a, and class 3R lasers may be used for construction work. Class 3b and class 4 lasers are prohibited.</p> <p>The operator and other personnel using the laser must take precautions necessary to ensure that other contractor personnel, equipment, and vehicles do not cross the path of the beam, must keep nonessential personnel away from the target area, and keep objects with mirror-like surfaces, such as rings and watches, out of the target area.</p> <p>When possible, the laser operator must ensure that engineered controls, for example, “screens,” are used to minimize the likelihood that the beam or reflections will escape the target area.</p> <p>If the laser is not in use, the operator must turn it off.</p> <p>All persons must avoid looking into the beam or any reflection of the beam off a mirror-like (shiny) surface.</p>
Lead Paint		(fill in if needed)
Asbestos		(fill in if needed)
Scaffold		(fill in if needed)
Personal Lift		(fill in if needed)

Material Safety Data Sheets (MSDS) (Use of this section is optional between the contractor and project manager/tech rep.

Hazardous materials to be used on this site are:

- 1. _____ 3. _____ 5. _____
- 2. _____ 4. _____ 6. _____

Argonne Contractors Requirements for Construction Projects

- 1. All contractor personnel assigned to work under construction contracts on the Argonne site will attend the Argonne Contractor Safety Orientation (CSO) for Construction contracts. The contractor must maintain proof of this training on his/her person by carrying the CSO Argonne card, provided by the instructor. The contractor must provide proof of this training to the Argonne or DOE representative when requested.
- 2. The contractor must have a 10-hr OSHA trained employee on site at all times when work is performed. This employee is the contractors ES&H Representative. Proof of this training must be provided and the employees name will be written on the JSA cover page.
- 3. All contractor personnel must attend building/area orientation in relation to their scope of work to ensure they are aware of shelters during severe weather or emergency evacuation meeting points as well as any other special conditions in relation to the specific building/area.
- 4. The contractor must report in daily, by 8 am, the number of employees he has on site by calling 630-252-7200. Additional information required includes the building number or area where the work is being done as well as the contract number. In addition, notification to the PS/Tech Rep of arrival and departure is required.
- 5. Imminent danger violations will result in an immediate 6-month suspension. Other lesser violations will receive “tickets” and/or other penalties per the contract.
- 6. All energized electrical “hot work” requires a, reviewed and approved written procedure, along with a completed and approved Energized Electrical Work Permit (ANL-211) that details all steps to be taken, safe guards to be used and PPE needed to safely conduct this evolution.
- 7. In case of any injury or illness, no matter how minor, contact the Argonne National Laboratory Fire Department by calling, 911 (inside line) or, by calling 630-252-1911(cell phone). The Tech Rep/PS must also be immediately informed of the situation.

Review of Emergency Information:

Emergency Phone Number Argonne Phone – 911.....Cell Phone 630-252-1911

Location of assembly point: _____

Location of Tornado Shelter _____

This information to be provided by the Argonne PS/Tech Rep.

Basic Safety Rule Reminders:

1. Hard hats must be worn where there is a potential of falling objects, or bump hazards. All hard hats must comply with ANSI Z89.1, American National Standard for Industrial Head Protection.
2. Safety glasses with side shields are required to be worn at all times. All safety eyewear must comply with ANSI Z87.1, American National Standard Occupational and Educational Personal Eye and Face Protection Devices.
3. Above-the-ankle sturdy leather work boots must be worn at all times in the work zones.
4. All tools and equipment must be inspected by Argonne before use. Do not use defective tools.
5. Contractor competent persons must be on site when activities involving their discipline are being conducted.
6. Fall protection (e.g., handrails or full body harnesses) must be used when working at heights above 6 feet. Fall protection is not required when working from portable ladders.
7. Where work creates hazards, these work areas must be clearly marked (e.g., barrier tape, snow fencing, traffic cone, etc.) and appropriate signage posted to alert passers-by to hazards. All signage must be in compliance with 29 CFR 1926.200, Specification for accident prevention signs and tags.
8. All portable electric tools and equipment 125v or less must be protected by the use of a Ground Fault Circuit Interrupter (GFCI). The GFCI must be tested daily before use.
9. Do not allow materials or equipment to obstruct stairways, passageways, and access ways.
10. Maintain an orderly work area.
11. All injuries/illnesses and near misses must be reported to the PS/Technical Representative as soon as possible.
12. All portable ladders must be made of non-conductive material (e.g., wood or fiberglass).
13. **NO DUMPING OF ANY KIND SHALL BE PERFORMED ON SITE WITHOUT USE OF A QUALIFIED AND COMPETENT SPOTTER.** After dumping their loads, all trucks must lower their beds before driving away.
14. Any laser use (class 3a, 3b, or 4) requires an Argonne ES&H review.

1 The contractual requirements for the contractor's Safety Program are given in Appendix A, Argonne
2 Terms and Conditions. The Laboratory will evaluate and approve the contractor's Environment, Safety,
3 and Health Plan as described in the Appendix A, Argonne Terms and Conditions.
4

5 The Laboratory will evaluate and approve the contractor's Safety Program on the basis of recognized
6 standards or recommendations including, but not necessarily limited to OSHA - Occupational Safety and
7 Health Administration Regulations, EPA - Environmental Protection Agency Regulations, recognized
8 industry standards or recommendations including, but not necessarily limited to OSHA, ANSI, NIOSH,
9 AWWA, ACGIH and SSPC. The plan shall include defined responsibilities for a safety coordinator (ESH
10 Representative) as described in Appendix A.
11

12 CONTRACTOR JOB-SAFETY ANALYSIS (JSA) & Daily Safe Work Plan (SWP)
13

14 The Laboratory will evaluate and approve the contractor's JSA Plan. The JSA is a document submitted by
15 the contractor defining specific types of work that will take place on this job, the hazards expected during
16 those specific types of work, and the precautions that will be taken to mitigate the anticipated hazards.
17 The Daily Safe Work Plan is required to address the daily task hazard details that were documented in
18 the JSA.
19

20 The JSA shall describe in detail the proposed work, safety risks, and procedures, steps, or plans that will
21 be taken to address the known hazards. A blank form is included with the contract documents. **All items**
22 **discussed in this specification should be addressed as a minimum. Any other hazards that you**
23 **suspect could occur should be addressed and included in the JSA.** Lifts plans, training, certificates,
24 etc. that are referenced and MSDS documents shall be included with the JSA upon submittal to the
25 Laboratory. The JSA will take about 10 days to review and approve. The JSA shall be approved prior to
26 the start of work.
27

28 The JSA should contain a sufficient number of individual items that will cover the activities planned under
29 the subject contract. Every individual item does not need to be described; however, every type of work
30 shall be covered. This allows for all potential safety issues to be discussed, proper steps taken to prevent
31 accidents and make all participants in the process aware of the hazards at the work site. The blank form
32 has three columns. The left column identifies the type of work. The middle column identifies the hazards
33 associated with that type of work. The third column identifies the steps that will be taken to eliminate,
34 reduce or control the expected hazards.
35

36 The JSA has a cover page that identifies responsible personnel for both the contractor and Argonne
37 personnel. This cover page will include the space for the JSA approval. The subsequent pages of the JSA
38 shall be grouped by function: first - identify general items, second - specific and individual activities
39 planned for the project, and the third - provide required documentation.
40

41 The first functional group of items in the JSA should address basic issues such as identifying the basic
42 PPE requirements, requirements of the ESH representative, requirements for access to the site,
43 requirements for notification to ANL that the contractor is on-site, and the identification of the basic
44 training requirements. The last part of the beginning section should identify the general penalties for
45 safety violations.
46

47 The second functional group of items of the JSA should identify the many individual activities or types of
48 work that will be taking place under this particular contract. This project has high risk activities. Where
49 possible, a progressive order should be applied to activities described. These items should include
50 equipment and material delivery and inspection, work area control, description of excavation activities,
51 road-traffic control issues, MSDS sheets, erosion control, equipment operation-backup alarms, dumping,
52 etc. The goal is to identify the hazard, understand the risks, and identify the precautions.
53

1 The last functional group of items in the JSA should be the attachments of referenced items or other
2 required items. For this project, they could be the MSDS documents, qualifications such as 10-hour
3 OSHA training, fall protection plans, asbestos training, lockout/tagout training, etc.
4

5 The Contractor should request a preliminary meeting with the project manager assigned and Project
6 Specialist (PS) to discuss this critical document. The CONTRACTOR JSA must address all hazards
7 identified in the following specific safety topics and others that the contractor may be aware of.
8

9 SPECIFIC SAFETY TOPICS

10
11 Tool and Equipment Inspections - All tools and equipment shall be inspected prior to use. The contractor
12 should not bring any equipment that is damaged, worn, modified without documentation, or otherwise not
13 safe to the site. The use of special equipment such as cranes, fork lifts, man lifts, and scaffolding require
14 special documentation, training, etc. These special documents or training shall be required when
15 applicable such as load charts, medical certificates for operators, annual inspections, training, competent
16 persons, etc. All tools shall be used for their designed purpose. Lifting devices, ropes, etc. are expected
17 to be required on this job. Ropes, chokers, etc. must be rated for the expected load.
18

19 Fire Extinguishers – A 10 pound ABC fire extinguisher is required within 100 feet all work areas, unless
20 open flame permit is required, then the fire extinguisher may be no more than 35 feet from the work.
21

22 Control of the Work Area - The contractor shall control access to the work area by dividing the area off
23 from normal access areas. This shall be done by combination of barricades, caution tape, and signs.
24 Detour paths shall be marked when necessary. ANL will notify building occupants. The required signs
25 shall state identify the hazards and precautions of the work area. These as a minimum are hard hats,
26 safety glasses, and sturdy work boots. Free silica dust exposure will be another hazard. Doorways,
27 sidewalks, etc. required to be closed or blocked shall be marked accordingly.
28

29 Other Contractors/Personnel in the work Area – Due to the circumstances of this project, pedestrians
30 could be in the area at the same time that this contract is underway. The PS must be made aware of daily
31 activities planned so conflicts can be avoided. The Laboratory has maintenance personnel that may need
32 to enter the area. They will coordinate their visits appropriately with the PS when possible. All personnel
33 entering the work area must follow the requirements of the workspace. Your ESH representative must
34 monitor the work area closely to avoid safety problems.
35

36 Confined Space Entry - Contractors shall come prepared to protect the safety of their employees,
37 providing necessary safety equipment and standby personnel.
38

39 Contractors shall comply with the OSHA General Industry Standard, 29 CFR 1910.146, "Permit-Required
40 Confined Spaces," as well as the aspects of confined space entry contained in 29 CFR 1926, the OSHA
41 Construction Standard.
42

43 Contractors shall submit a copy of their written confined space entry program and job-specific safety and
44 health plan to ANL project manager for review and approval. Deficiencies in contractor program will be
45 identified and the programs returned to the contractor via project manager for revision and resubmission.
46 Prior to entry into permit-required confined spaces, the contractor shall provide certification that
47 employees involved in the entry have been trained in accordance with the OSHA Confined Space
48 Standard.
49

50 Contractors shall have operating and calibrated equipment to monitor confined spaces actively (with a
51 sampling pump) for the basic hazards of oxygen deficiency or excess, combustible gases or vapors,
52 carbon monoxide and hydrogen sulfide. Contractors shall provide certification that the monitoring
53 equipment is calibrated and shall demonstrate competency to operate the equipment. A copy of the air
54 monitoring equipment operator's manual shall accompany the monitor.