

How to write a job safety analysis for oil and gas field work

Understanding how to write a job safety analysis starts with recognizing what happens when hazards go unrecognized on a job site. On August 16, 1989, three field employees were assigned to grind a bad weld inside a large pipe, at a valve located about 20 feet from the pipe's entry point. This SOP walks through how to write a job safety analysis (JSA) for oil and gas field work such as this weld repair, using the three-step JSA method: break the job into steps, identify existing and potential hazards, and develop a plan to eliminate or control them.



Outdoor construction site showing a large pipe and a job date of August 16, 1989, with three workers visible in the background.



Screen with the text "Step by step JOB SAFETY ANALYSIS" overlaid on a construction site, showing workers in hard hats and rebar structures.

A JSA finds and removes or minimizes hazards before work starts, helping prevent accidents and fatalities. You can also run a JSA throughout a project, not only before the job begins, to keep identifying and addressing hazards as conditions change.



Instructor in blue hard hat and glasses gesturing with hands in front of rebar at a construction site

Prerequisites

Before you write a job safety analysis, confirm which safety standards apply to your site.



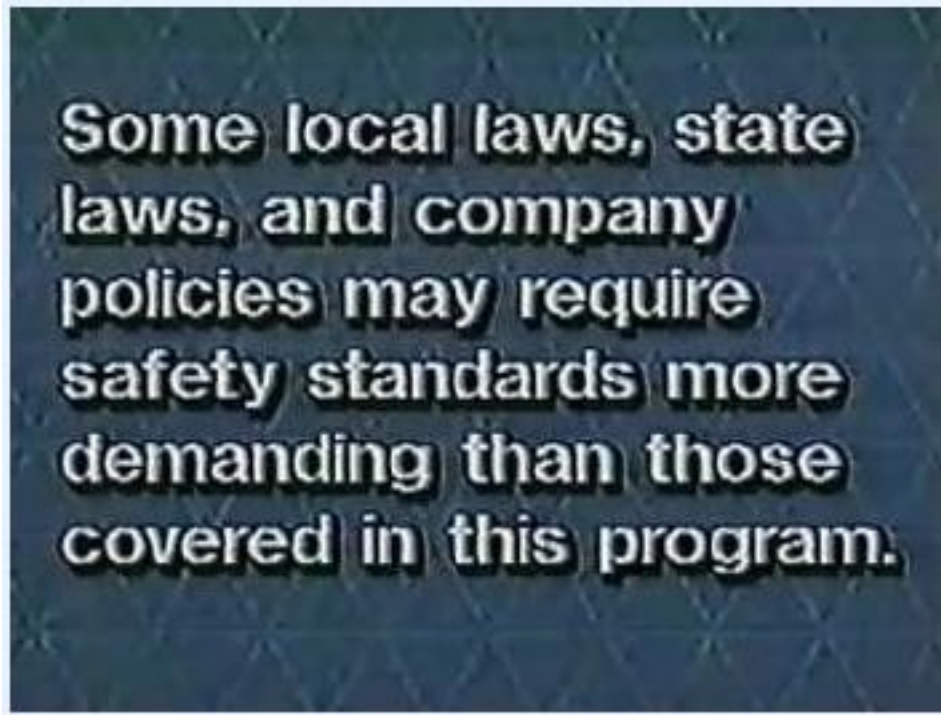
Instructor in blue hard hat and glasses gesturing in front of rebar and construction materials at a construction site



The supervisor stands near caution tape, reinforcing the message that safety is a shared responsibility.

- Some local laws, state laws, and company policies require safety standards more demanding than the general JSA process described in this SOP.
- Check and comply with your local, state, and company-specific safety regulations before starting any job.

- Do not assume this SOP covers every possible safety requirement for your site.



Screen displaying the safety disclaimer: local, state, and company safety standards may exceed those covered by this program.

Job scope

Record the job's identifying information at the top of the JSA worksheet before you begin the analysis.

- Job title: name the task being analyzed, such as grinding a bad weld inside a pipe.
- Work order / task objective: repair a defective weld found in a pipe section, near a valve located approximately 20 feet from the pipe's entry point.
- Date: enter the date the job is performed; the worksheet includes a dedicated date field so you can track when the analysis was conducted.
- Required personnel and protective equipment: the worksheet also includes fields for the personnel assigned and the protective equipment the job requires.

- Operating status: confirm and record whether the asset is live or isolated before entry, alongside the other job identification fields.



Three workers in hard hats and work attire walking toward a large pipe at a construction site.

A real-world example of this scope is a pipe weld repair job in which three employees were assigned to grind a bad weld at a valve about 20 feet inside a large pipe.



View of a pipe resting on supports at a construction site, showing the asset where the confined-space weld repair takes place.

Crew and equipment

Identify who will perform and observe the job, then gather the tools and protective equipment the task requires.

- Roles: assign a worker to perform the job and a second person to observe and record the JSA; for confined-space work, designate a dedicated attendant.
- Competent persons: choose a worker who is capable, experienced, and willing to share ideas about the job, since this input strengthens the hazard analysis.
- Briefing: if the selected worker has never taken part in a JSA before, explain the purpose and process clearly before you start.
- Tools: a power grinder for weld work, a sampling pump with a hose for air testing, and non-sparking tools where sparks could ignite a hazardous atmosphere.

- PPE: hard hats, safety glasses, gloves, face shields, hearing protection, safety harnesses, and respiratory protection such as a breathing apparatus with air tanks and gauges.

- Critical spares: the source material for this SOP does not list specific spare parts or backup equipment; record any critical spares your site requires directly on the worksheet.



Close-up of the pipe entrance with an oxygen hose and grinding equipment visible; a worker's gloved hand holds equipment at the pipe opening.



Worker in a hard hat and glasses holding a clipboard at a construction site, surrounded by construction equipment and materials.



Two workers in hard hats at a construction site; one holds a clipboard and explains the JSA worksheet to the other.



Worker putting on heavy-duty gloves before a task involving potential exposure to hazardous materials.



Respiratory protection equipment, including air tanks, gauges, and a mask, laid out on the ground at a worksite.

Task steps

Follow this sequence to write a job safety analysis, from selecting and prioritizing the job through observing and recording every step.

Prioritize the job

- Review injury and illness records and workers' compensation files to find jobs with frequent or severe incidents.
- Prioritize jobs with frequent accidents, a history of disabling injuries, or the potential to cause severe injury.
- Pay special attention to new jobs with little or no history, and to jobs where the procedure, equipment, or materials have changed.

Prepare to begin the analysis

- Select the specific job to analyze, then bring the JSA worksheet, a clipboard, writing tools, and PPE to the job site.

- Choose a worker who is capable, experienced, and willing to share ideas, and explain the JSA process if the worker has not taken part before.

List the job steps

- Break the job into its basic steps and list each one in sequential order in the worksheet's first column.
- List every step of the job before you move on to identifying hazards.
- Complete this column fully before moving to the next one, so no step is overlooked.

Example: sequenced steps for a material-handling job

1. Lift lumber onto table.
2. Measure board with tape.
3. Place board for cutting.
4. Lift saw.
5. Saw board.
6. Lift board into trailer for hauling.
7. Walk to and from trailer.

Example: sequenced steps for a confined-space weld repair

8. Climb into the pipe.
9. Grind the weld using a power grinder.
10. Climb out of the pipe.

Observe the job on-site

- Watch the worker perform the job and record each step in detail, standing close enough to observe but at a safe distance.
- Ask yourself what the worker is doing, what tools or equipment are in use, and what hazards could arise at each step.
- Record each action as it happens, such as lifting, bending, or handling materials.
- Use video recording where possible, then pause or rewind the footage to pinpoint and document details accurately.

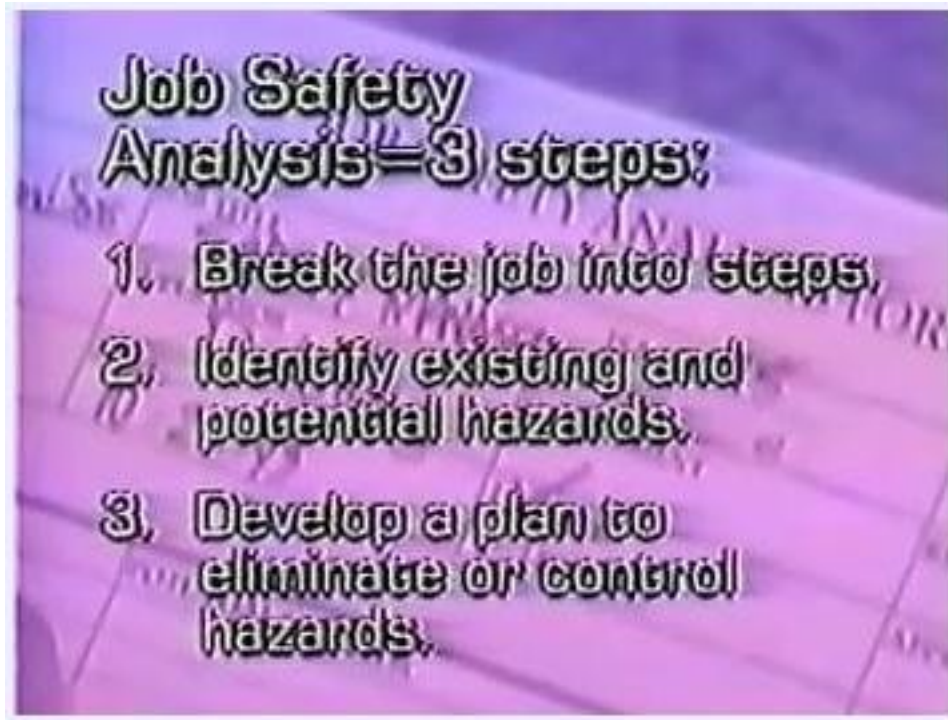
- Conduct a JSA for every job on the site, not only for high-risk tasks.



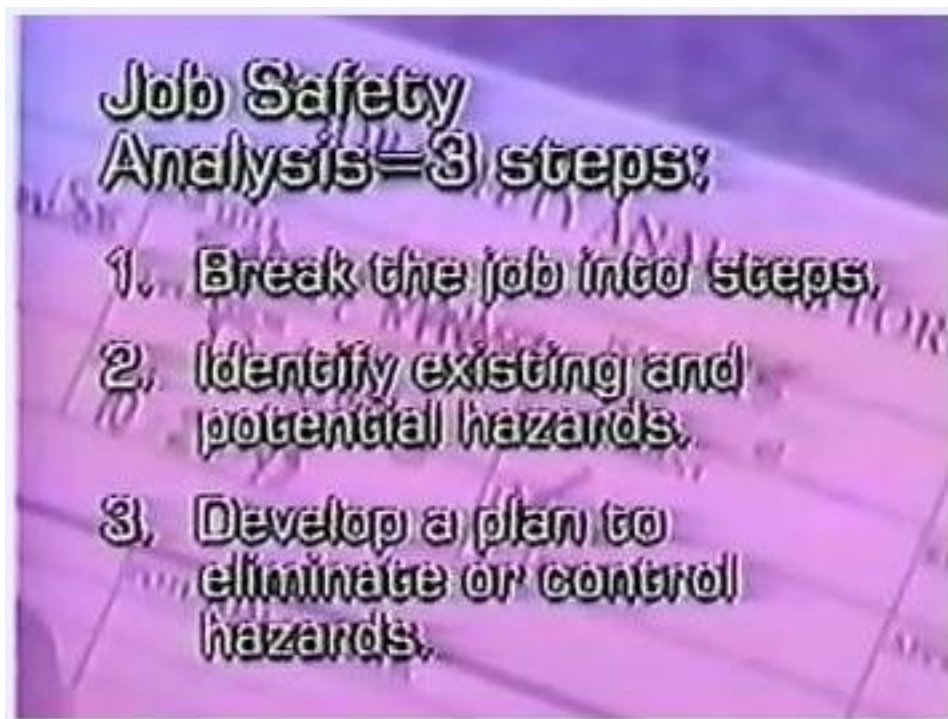
View of the pipe on supports at a construction site, with no people visible, emphasizing the work environment where the incident occurred.

Complete the handback

The source material for this SOP does not describe a formal handback step; record the job's completion and any final checks on the worksheet before you close out the JSA.



Screen summarizing the three-step method: break the job into steps, identify existing and potential hazards, and develop a plan to eliminate or control hazards.



Worker in a hard hat and glasses filling out paperwork at a desk, surrounded by binders and posted documents.

JOB SAFETY ANALYSIS

TASK/LOCATION <i>SLAP MAXTAR W...</i>	EMPLOYEE'S TITLE <i>...</i>	LICENSED PERSONAL <i>...</i>	EFFECTIVE PERMITMENT <i>...</i>	ORDER OF JOB STEPS <i>...</i>	DATE <i>10/22/93</i>	REVIEWER <i>D. Ludwig</i>	JSA No. <i>15</i>	PAGE <i>61</i>	DEPARTMENT <i>...</i>	RECOMMENDATION <i>NEW</i>
--	--------------------------------	---------------------------------	------------------------------------	----------------------------------	-------------------------	------------------------------	----------------------	-------------------	--------------------------	------------------------------

Worker in a hard hat writing on a clipboard at a construction site while another worker installs pipe in a trench.



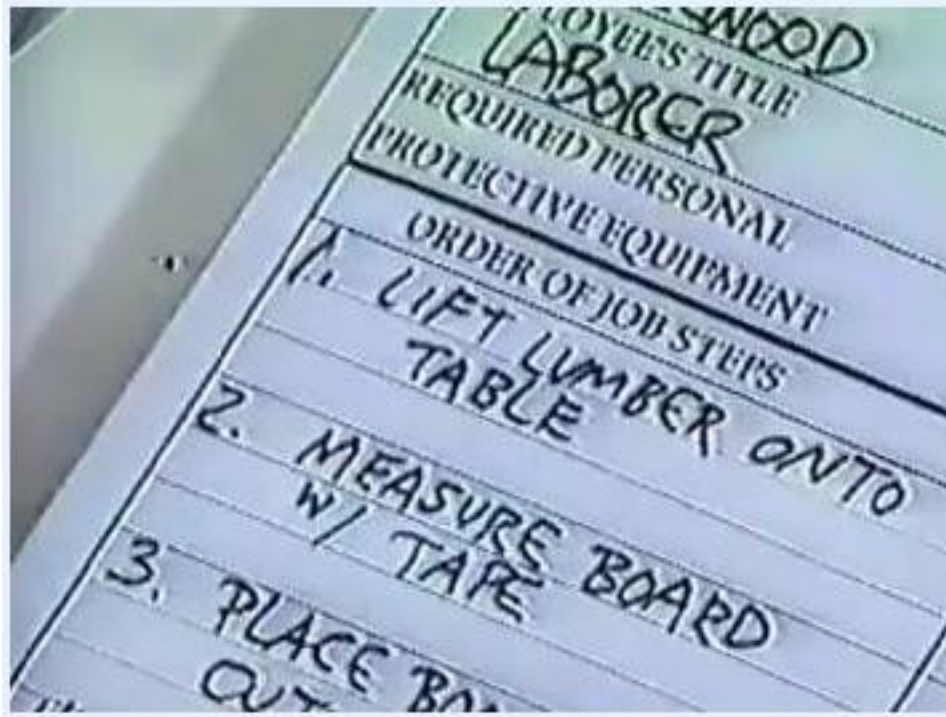
Worker in PPE standing in front of a large pipe, explaining the setup for the sample JSA.

JSA WORKSHEET		DATE	TIME	REMARKS
1. LIFT LUMBER ONTO TABLE		10/22/93	16	
2. MEASURE BOARD w/ TAPE	MEASURING			
3. PLACE BOARD FOR CUTTING	LIFTING			
4. LIFT SAW	CUTTING			
5. SAW BOARD	NONE			
6. LIFT BOARD INTO POSITION FOR NAILING	NONE			
7. NAIL BOARD INTO PLACE	BENDING / LIFTING			
	CUTS FROM SAW BLADE			
	BENDING / LIFTING			

Close-up of a JSA worksheet with job steps listed in the first column, including "Lift lumber onto table" and "Measure board w/ tape."

JSA WORKSHEET		DATE	TIME	REMARKS
1. LIFT LUMBER ONTO TABLE		10/22/93	16	
2. MEASURE BOARD w/ TAPE	MEASURING			
3. PLACE BOARD FOR CUTTING	LIFTING			
4. LIFT SAW	CUTTING			
5. SAW BOARD	NONE			
6. LIFT BOARD INTO POSITION FOR NAILING	NONE			
7. NAIL BOARD INTO PLACE	BENDING / LIFTING			
	CUTS FROM SAW BLADE			
	BENDING / LIFTING			

JSA worksheet being completed one column at a time.



Two workers at a construction site; one observes and takes notes on a clipboard while the other works with lumber.



Hand searching through labeled file folders containing injury and illness records.



Hands searching through additional file folders while gathering records for analysis.



Worker reviewing documents at a counter, with on-screen text listing frequent accidents, a history of disabling injuries, and the potential for severe injury as prioritization criteria.



Two workers in hard hats reviewing documents and equipment at a construction site table, checking a job with changed procedures.



Worker in a hard hat and denim jacket holding a clipboard at a construction site, ready to begin the JSA.



Two workers in hard hats near a brick wall; one explains the JSA worksheet details to the other.



Worker observing and taking notes on a clipboard while another worker handles rebar at a construction site.



Worker bending over to secure rebar on a concrete slab, demonstrating a specific job step.



Worker in a hard hat and gloves lifting a concrete block while another worker observes.



Worker lifting a block at a construction site, shown within a video frame overlay to illustrate the use of video for analysis.



Worker climbing into a pipe while another worker stands by, both wearing hard hats and PPE.



Worker bending over to handle blocks at a construction site, shown within a video frame overlay.

Hazards and controls

Identify the hazards tied to each job step, then document the engineering or administrative controls that eliminate or reduce them.

List hazards for each step

- Watch the employee perform the job again, this time focusing on hazards created by both the procedure and the environment.
- Talk with employees and ask questions about the job steps and potential hazards; this dialogue surfaces risks that are not immediately obvious.
- Recognize that any change to the environment, such as weather, lighting, or site layout, can introduce new hazards.
- Record hazards in the worksheet's second column, such as cuts, strains, bending/lifting injuries, and cuts from a saw blade.

- Once hazards are identified, record suggestions to eliminate or control each one in the worksheet's third column.



Worker in PPE gesturing while standing next to a large pipe, reinforcing the importance of the JSA worksheet.

Confined-space hazard example

- Getting trapped while entering the confined space.
- Cuts from rough or sharp edges.
- Poor visibility inside the work area.
- An oxygen-enriched, flammable atmosphere: in the case-study incident, feeding an oxygen line into the pipe to help a worker breathe created an oxygen-rich atmosphere that ignited from grinding sparks, fatally injuring the worker.

Never introduce pure oxygen into a confined space unless a qualified safety professional directs it. This is the hazard that caused the fatal fire in the case-study incident.

Table hazards, energy sources, barriers, and residual risk for each step

Job step	Hazard	Energy source	Barrier / control	Residual risk
Climb into the pipe	Entrapment, poor visibility, oxygen-enriched atmosphere	Confined-space geometry; oxygen feed line	Test air quality with a sampling pump instead of feeding oxygen into the space; assign an attendant; post confined-space signage	Fire or entrapment if the air is not tested or the attendant is not present
Grind the weld	Cuts, sparks, flying debris igniting a flammable atmosphere	Powered grinder	Face shield, gloves, non-sparking tools	Burns or cuts if PPE is not worn or non-sparking tools are unavailable
Climb out of the pipe	Smoke, fire, delayed rescue	Same atmosphere hazard as at entry	Attendant with a rescue line and constant communication; immediate rescue response	Severe injury if rescue is delayed, as in the case-study incident
Lift, measure, and saw lumber	Cuts, strains, bending/lifting injuries, cuts from the saw blade	Manual handling; saw blade	Replace manual lifting with machinery such as a forklift; use proper lifting technique	Strain injury if manual handling is still required for remaining steps

Reduce hazards with engineering controls

- Replace manual labor with machinery, such as using a forklift instead of employees manually lifting and carrying heavy blocks.

- Assess whether the frequency of a hazardous job can be reduced, for example by optimizing delivery or storage locations to cut down on the number of times materials must be moved.
- Change physical conditions in the work environment, such as workspace layout or equipment, to remove or reduce risk.
- Plan and communicate changes to the worksite through site walkthroughs with supervisors and workers, using maps or plans to discuss modifications.
- Modify job procedures to reduce risk, such as using a sampling pump with a hose to test air quality in a confined space instead of sending a worker in to check it.
- Eliminate physical problems in confined spaces where possible, such as placing a board to allow safer entry or work inside the space.
- Use alternative tools, such as non-sparking tools, in environments where sparks could cause a fire or explosion.
- Install warning guards and barriers, such as caution signage, to alert and protect workers from hazards.



Close-up of a worker expressing distress, with a split image showing another face in black and white.

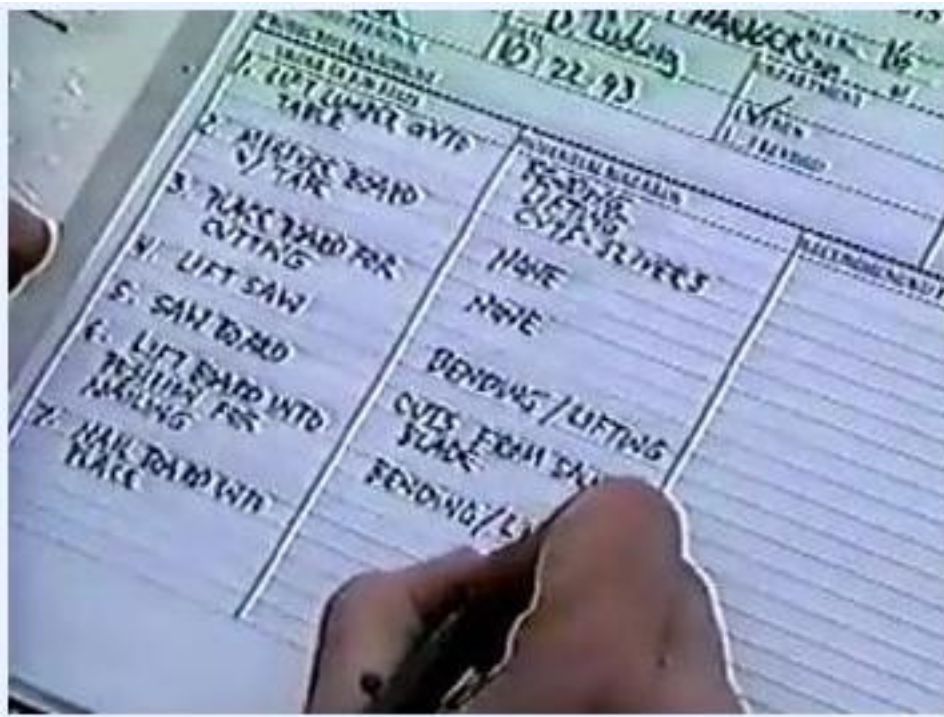
Reduce exposure with administrative controls

- Rotate employees through different tasks to limit the time any one worker is exposed to hazardous conditions.
- Provide safety education and training on procedures, equipment use, and hazard recognition.
- Hold regular team discussions with workers and supervisors to identify solutions and address safety concerns.
- Apply lessons learned and experience from similar jobs, combined with your own judgment, to adapt safety procedures to the current situation-
Apply lessons learned and experience from similar jobs, combined with your own judgment, to adapt safety procedures to the current situation, since every construction site is unique and presents its own set of potential hazards.

- Involve everyone in the JSA process so hazard identification and control benefit from the full team's observations and ideas.



Wide view of the pipe entrance with an oxygen hose trailing inside; the pipe is partially covered with cloth, moments before a fire broke out.



JSA worksheet showing hazards listed in the second column, such as "Cuts," "Strains," and "Bending/Lifting."

TASK	HAZARD	CONTROL
1. LIFT LUMBER ONTO TABLE	READING	
2. MEASURE BOARD	LIFTING	
3. TAKE BOARD FOR CUTTING	CUTS - FLAYERS	
4. LIFT SAW	NONE	
5. SAW BOARD	NONE	
6. LIFT BOARD INTO POSITION FOR NAILING	BENDING / LIFTING	BENDING / LIFTING
7. NAIL BOARD INTO PLACE	CUTS FROM SAW BLADE	CUTS FROM SAW BLADE

JSA worksheet with a hand writing in the third column, used for suggestions to eliminate or control hazards.



Worker in a blue hard hat and denim jacket standing in front of a block wall, with on-screen text reading ****"STEP 2 LIST HAZARDS."**



Worker wearing gloves handling rebar on a concrete slab, illustrating close observation of a manual task for hazards.



Worker assisting another worker entering a large pipe, with a caution sign visible at the site.



Worker in a white hard hat kneeling with a clipboard, taking notes while talking with another worker.



Worker adjusting hearing protection near a chain-link fence, illustrating a hazard introduced by the site environment.



Three workers in hard hats and plaid shirts working together at the entrance of a large pipe, demonstrating teamwork and hazard awareness.



Workers assisting a colleague entering a large pipe, highlighting the risk of entrapment and the need for vigilance.



A forklift transporting a large stack of concrete blocks at a construction site, replacing manual lifting.



Two workers in hard hats and safety gear reviewing blueprints and discussing changes to the work area.



Two supervisors in hard hats pointing and discussing the construction site layout while holding a clipboard.



Worker in a green hard hat and gloves placing a wooden board into a large pipe to allow safer confined-space entry.



Worker in a hard hat and gloves lifting a bucket, a physically demanding task that could benefit from job rotation.



Supervisor in a white hard hat demonstrating rope handling to a group of workers, with safety equipment visible in the background.



Group of workers in hard hats gathered around a stack of concrete blocks, discussing site safety and procedures.



Supervisor in a hard hat and glasses explaining the JSA process at a construction site.



Worker using a power tool while another documents the process; on-screen text reads "Identify the Hazards."



Supervisor in a green hard hat and safety glasses gesturing while discussing safety near yellow caution tape marking a hazardous area.

Permit requirements

Confirm which permits apply to the task before work begins, based on the hazards identified in the JSA.

- Confined space entry: required for any job that involves entering a pipe or similarly enclosed space. Assign a dedicated attendant for all permit-required confined space jobs; the attendant stays outside the space, monitors the situation, and maintains communication with workers inside.
- Hot work: applicable when grinding or other spark-producing tools are used near a flammable or oxygen-enriched atmosphere; use non-sparking tools where sparks could cause an explosion or fire.
- Gas testing: use a sampling pump with a hose to test air quality inside a confined space before and during entry, rather than relying on a worker to check conditions manually.
- Lifting, excavation, line break, and SIMOPS permits: the source material for this SOP does not describe specific procedures for these permit types; confirm your site's requirements for each before starting work that involves them.



Two workers in hard hats standing next to an oxygen cylinder at a construction site, discussing feeding a line into the pipe.

Post warning signage at the entrance to any hazardous or restricted area, such as a caution sign reading "LEVEL 2 CONFINED SPACE DO NOT ENTER WITHOUT PROPER EQUIPMENT."



Worker in PPE standing behind yellow caution tape near the pipe, highlighting restricted access and hazard awareness.



Worker in a blue hard hat standing in a taped-off construction area next to the pipe.



Worker in a green hard hat operating a sampling pump with a hose near a large pipe, preparing to test the air inside.



Two workers using non-sparking tools on a metal drum, with on-screen text reading ****"USE NON-SPARKING TOOLS."****



A yellow caution sign reading "LEVEL 2 CONFINED SPACE DO NOT ENTER WITHOUT PROPER EQUIPMENT," posted on a wall at a construction site.

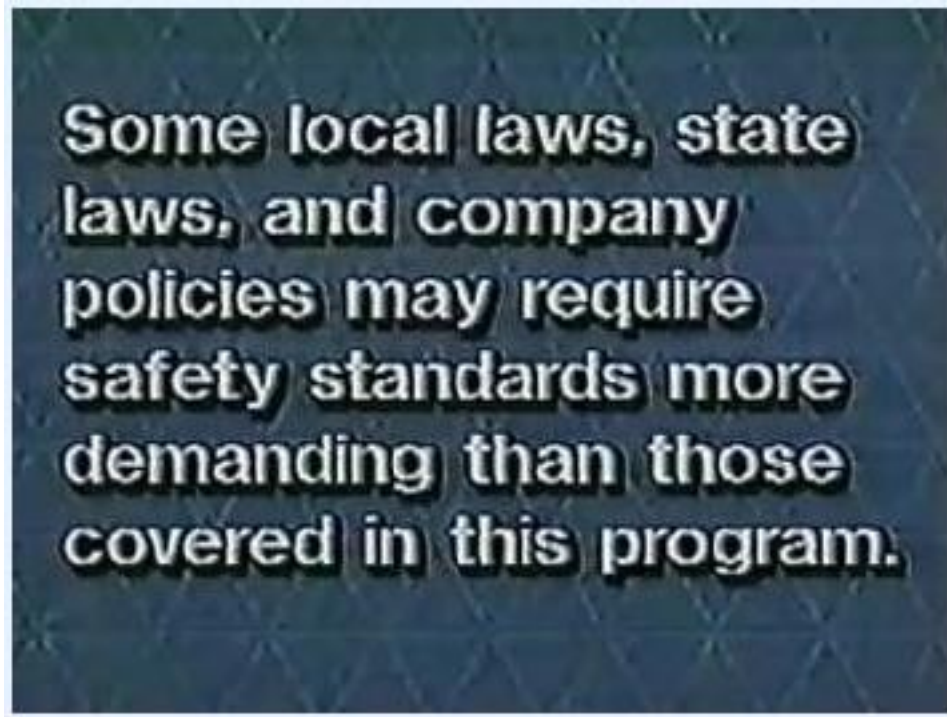
Emergency response

Prepare emergency response resources before work begins, since a confined-space incident can escalate within minutes.

- Attendant and communication: maintain constant contact between the confined-space attendant and workers inside the space, and watch continuously for signs of overexposure or distress.
- Rescue resources: in the case-study incident, the two workers outside the pipe reacted immediately to the fire, rushing to the entrance and pulling the injured worker 20 feet back to safety.
- Medical response: after the injured worker was pulled from the pipe, one worker left to get help while the other stayed with the injured worker until responders arrived; emergency personnel later arrived with a stretcher and medical kits.
- PPE for responders: workers and responders should wear appropriate personal protective equipment, such as hard hats and safety harnesses, when assisting in a rescue.

- Outcome awareness: despite the immediate rescue and medical attention in the case-study incident, the injured worker died the next day from severe burns, underscoring why prevention through JSA is critical.

- Muster point, spill response, and medical transport route: the source material for this SOP does not specify a muster point, spill response procedure, or medical transport route; document these details for your site as part of the emergency response plan.



Emergency responders and workers with PPE, a stretcher, and an open emergency vehicle at the incident scene.



Several workers and responders attending to an injured person on the ground, using a stretcher and PPE.



Two workers in PPE at the pipe entrance; one leans in with smoke billowing out while the other assists in the rescue.



Two workers attending to an injured person on the ground near the pipe entrance, with smoke and urgency visible.



Worker in a blue hard hat kneeling beside an injured person, with the pipe and emergency equipment visible in the background.



Worker in a pink hard hat and safety harness standing near a confined space entrance, holding a communication line.



Worker in an orange hard hat crouching near the entrance of a large pipe, speaking into a communication device.

Signoff

Close out the JSA by capturing team input, supervisor approval, and everyone's authority to stop work if a new hazard appears.

- Toolbox talk attendance: engage all team members in the JSA process, since a comprehensive hazard review depends on input from everyone on the crew, not just the observer.
- Team acknowledgment: remind workers that accidents affect everyone on the job site, not just the individual involved, and thank all workers for their attention and participation in the safety discussion.
- Stop-work authority: foster a culture where everyone feels responsible for safety and is encouraged to contribute ideas and observations, and to identify hazards even after work has started.

- Supervisor approval: the source material for this SOP does not describe a formal supervisor sign-off step; record supervisor approval of the completed JSA worksheet according to your site's documentation requirements.



Close-up of a worker in a pink hard hat, expressing concern and speaking directly to the camera.



Supervisor gesturing toward the construction site to emphasize reducing hazards, with caution tape and a partially built wall visible.

Improving safety procedures benefits everyone on the job site. Safety is a shared responsibility, and every worker's participation strengthens the analysis.



Worker climbing into a pipe while another stands by, both wearing hard hats and PPE at a construction site



Two workers, one in a green hard hat and one in a pink hard hat, discussing safety procedures at the construction site.



Close-up of a worker in a pink hard hat speaking about the impact of accidents on the team.

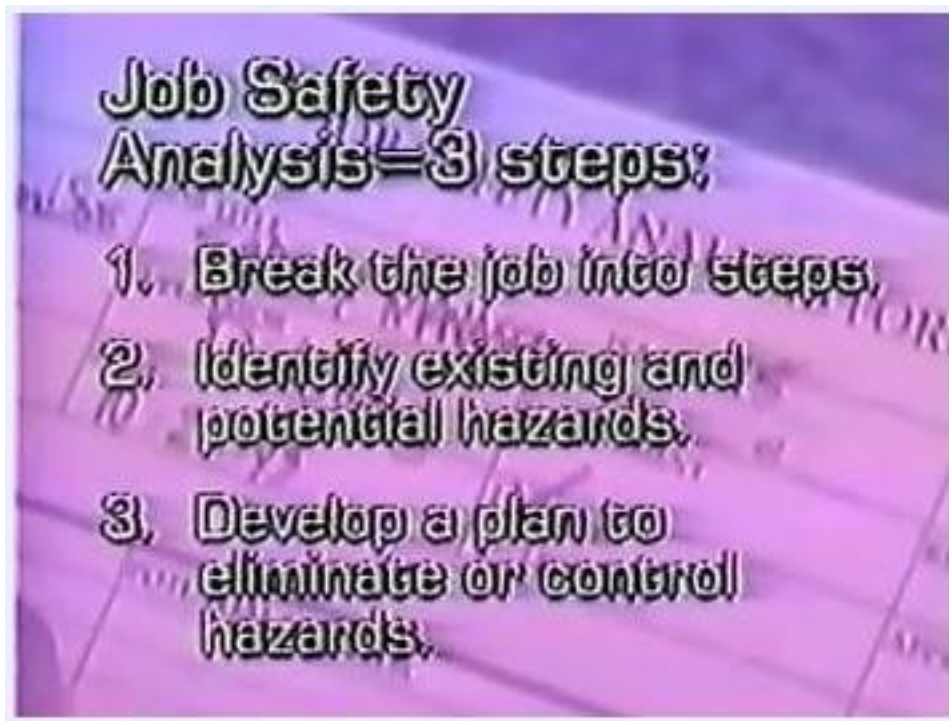


The two workers in green and pink hard hats standing together, concluding the safety discussion.

What's next

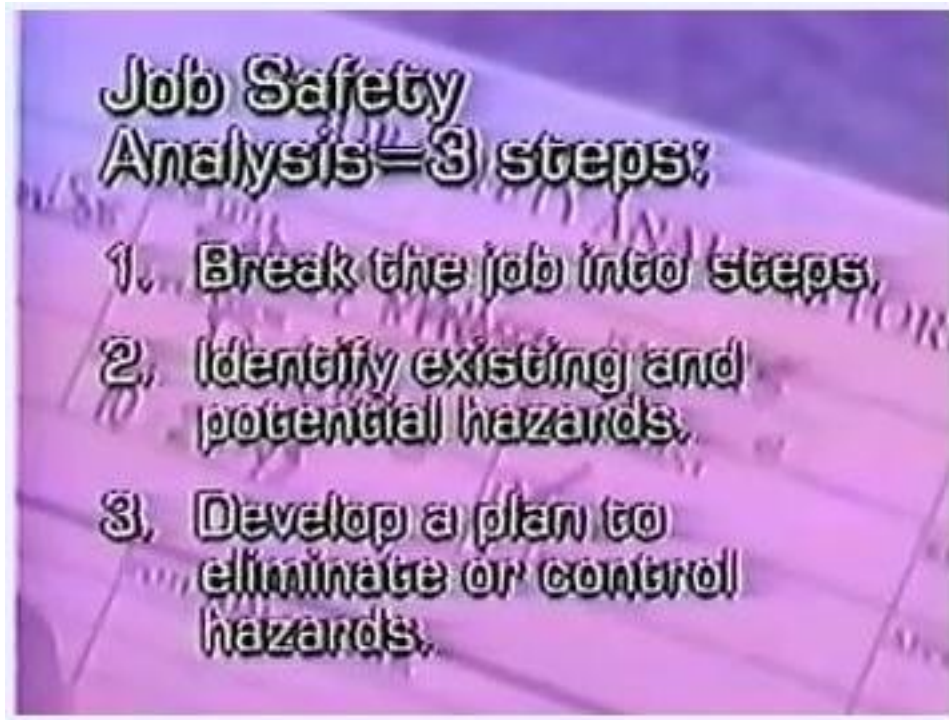
Use the completed JSA worksheet as an ongoing resource beyond the initial analysis:

- Train new or existing employees using documented job steps and hazards.
- Update or create standard operating procedures (SOPs) based on JSA findings.
- Record safety information for jobs that are performed infrequently.
- Support employee performance reviews, training programs, and accident investigations with the documented worksheet.



Close-up of a hand-completed worksheet titled "JOB SAFETY ANALYSIS," showing entries for job title, date, and job steps.

Continue running a JSA throughout the course of a project, not only before a job starts, so that hazards are identified and controlled continuously as site conditions change.



Screen showing "Job Safety Analysis – 3 steps: 1. Break the job into steps, 2. Identify existing and potential hazards."



Close-up of worker in blue hard hat and glasses, explaining safety considerations at a construction site



A worker in a hard hat stands behind yellow caution tape at a construction site, demonstrating hazard marking.