

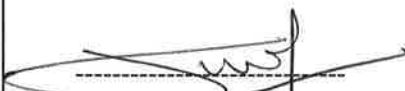

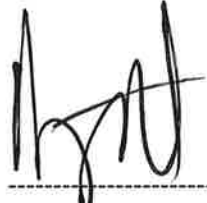


# **DIMENSION BID**

WIRELINE INTERVENTION | PERFORATION SERVICES

## **OPERATIONS SAFETY GUIDE DBSB-HSE-12**

ORIGINAL ISSUE : 19/11/2002  
REVISION NUMBER : 06  
REVISION DATE : 01/12/2014

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## AMENDMENT RECORDS

This sheet will record all amendment of this Procedure. All particulars of the amendment shall be stated clearly. The HSE Department of Dimension Bid (M) Sdn. Bhd. (DBSB) shall be responsible for the maintenance and update of this record sheet.

CLASSIFICATION	DATE	REVISION PART	REASON/PURPOSE OF REVISION
Original Issue	19/11/2002	Establishment of procedure	Nil
Revision 1	12/01/2003	1. To add in element 6.8 and 7.0	1. To enhance the procedure
Revision 2	20/05/2003	1. Front page 2. Amendment sheet	1. Standardize the procedure to make it consistent with Doc. Control procedure
Revision 3	20/12/2005	6.5.6 Lifting Procedure	1. To enhance the lifting Procedure and includes skidding wireline mast.
Revision 4	25/06/2012	1. Front Page 2. DBSB – HSE – 12 - 03 3. DBSB – HSE – 12 - 04 4. DBSB – HSE – 12 - 07 5. DBSB – HSE – 12 - 08 6. DBSB – HSE – 12 - 11 7. DBSB – HSE – 12 - 02	1. Replace with new DB slogan 2. to add Braided Line Operations Safety 3. To add E- Line Operations Safety 4. To add Basic safety for Perforation 5. to add hazardous gas or environment 6. To add working at height 7. Formatting the existing basic slickline safety
Revision 5	08/01/2013	• Cover	• Organization restructure
Revision 6	08/01/2013	• Cover	• Organization restructure

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## FLOW CHART

<u>RESPONSIBILITIES</u>	<u>PROCEDURE</u>	<u>DOCUMENTATION</u>
Line Manager, Team Leader , Wireline operator	Pre – Job Meeting	Morning Meeting Summary / Attendant
	↓	
Section Concern	Job safety Analysis (JSA) & Personal Protective Equipment (PPE)	Job Safety Analysis (JSA) recorded
	↓	
Crew	Equipment Check and Preparation	Inventory
	↓	
Crew	Housekeeping after job completed	

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**Subject**                      **General**

**Purpose**                      This procedure is to provide guidelines on safety precaution during working in all process or activities involved either at warehouse or offshore.

**Scope**                      This procedure covers all activities at Warehouse and Offshore with potential hazard to safety and health of employees at place of work or person other than our employees at place of work (supplier or visitors).

**References**                      1. Occupational Safety and Health Act 1994, Act 514  
2. Factories and Machinery Act 1967, Act 139

**Coordination Meeting**                      Warehouse crew or wire line crew on location must attend the daily coordination meeting. The primary objective of the meeting is to discuss activities for the day to ensure safe execution of jobs without any conflicting activities

Work permit relevant to the job assigned to DB shall be presented during the meeting and planned activities be discussed. Officer In-charge (OIC) may clarify issues, which can affect the planned job in areas of safety or operational issues and to agree on solution or precautions needed be taken.

Refer to Client's Regulations/Rules/ Requirements for details.

**Permit to Work (PTW)**                      Permit to work must be obtained and duly authorized by OIC responsible for site before any work can proceed.

DB site representative has to discuss with client's supervisor regarding next job plan and prepare the work permit application. He has to submit a completed work permit form to the line supervisor and make sure it is ready for presentation during the daily coordination meeting. Permit to work application form is obtained from the client.

Refer to Client's requirement for applying PTW.

**Pre-job Meeting & Job Safety Analysis (JSA)**                      Prior to commencement of any non-routine work, Job Safety Analysis (JSA) followed by a pre job meeting shall be conducted at work site. Its objective is to make sure everyone involved in the operation understands the work program details and their respective responsibilities. All relevant personnel are to attend this meeting where safety is discussed along with operational matters.

Safety precaution needed to contain or eliminate potential hazards associated with each phase of the operation has to be understood and implemented. Issues which may arise in this meeting are to be resolved

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before actual work can proceed.

**Personal  
Protective  
Equipment (PPE)**

Appropriate PPE must be worn at all times while at work. They are meant for your personal protection. Therefore it is important that all personnel be self-disciplined and complies with this requirement or other regulations as may be dictated on notices in certain work areas on the use of safety equipment.

Refer to DBSB-HSE-01 (Personal Safety) & DBSB-HSE-02 (Personal Protective Equipment) for details.

Refer to Client's Regulations/Rules/Requirements for details.

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**Subject**                      **Slickline Operations Safety**

**General**                      Good safety performance can be achieved through understanding and compliance to safety rules and procedures. Every job can be accomplished safely when safety is well understood by each individual and taken as an integral part of the job.

One of the important roles which DB site representatives(wire line operator/supervisors) must perform well is to communicate safety procedures to immediate subordinates and provide supervision to ensure full understanding and practice strict compliance to related safety requirement and regulations. Through proper planning and supervision, safety awareness amongst DB personnel shall be enhanced.

**Equipment Checks and Preparation**

1. Be sure the company / client's representative knows when you are rigging up and when you have finished working on a well.
2. Welding operations and wire line operations should not be conducted simultaneously.
3. Upon reaching a work location, review the wire line program details, discuss your job with the oil company representative, and then recheck your equipment to be sure you have everything you need to complete the job. Do not wait until you are ready to work and find out you need additional tools.
4. Each person on the job should be aware of the activity of other person at the worksite. Try to evaluate the others capabilities to avoid creating a dangerous or critical situation.
5. Brief all personnel working in the vicinity of your work area of any dangers that they might not be aware of during wire line operations.
6. Do not use any connection, wire line valve, lubricator, stuffing box or any surface equipment on a well that is subject to having a surface pressure that exceeds working pressure of the surface equipment.
7. Do not use any connection, wire line valve, lubricator, stuffing box or any surface equipment on a well that is subject to having a surface pressure that exceeds working pressure of the surface equipment.
8. Function fit all connections and inspects all threads on pressure equipment, lubricator, X-mas tree connections to be sure they are in good condition. Keep threads cleaned, greased and place them in the right position to protect them from being damaged.
9. Inspect all lifting equipment, sling, shackles, clamps, nut and bolts and other lifting devices to be sure they are in good condition.

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10. Check all safety systems, valves and other surface equipment to be sure that they are in proper settings and in the right positions. Double check them once you have finished working on the well.
11. No smoking is allowed on or near well site or everywhere else outside the living quarters.

#### **Rigging Up / Down**

1. Never rig up a wire line valve and never assume that a dead well will always stays dead
2. Be sure you rig up sufficient length of lubricator to accommodate wire line tool string
3. Use copper or brass hammer when making up or breaking loose hammer unions.
4. Do not get under the lubricator when rigging up or down. If the wire should break or in case the wire clamp slips, the tools could fall on you. Also stay in a clear position when making up or breaking the tools string to prevent being injured should the tools fell.
5. Do not use a rope tied to the lubricator in the place of a pickup eye/lifting clamp. Inspect rope for frayed knots and weak spots.
6. Check all O-ring on lubricator for cuts or excessive wear before making up. This could prevent a leak after lubricator is pressured up.
7. When making / stacking the lubricator up, be sure the bleed off valves or needle valves are opened to prevent a pressure build up in the lubricator in case the valves on the tree are leaking.
8. Chain unit securely so that it cannot slide or turn over when bind is put on wire line.
9. Make sure the weight indicator is securely tied with the proper size chain so that it would not come loose. Secure all chain ends to prevent knot from coming loose.
10. Do not hammer or attempt to use wrenches on surface equipment that contains pressure in it.
11. When pressure testing lubricator / BOP increase pressure in stages. After lubricator has been pressured up, check all surface equipment for leaks.
12. Never attempt to remove the lubricator without first releasing the pressure. The needle valve near the lower end of the lubricator is used for this purpose. Cycle the needle valve (open & close) a few times to check for plug and/ or trapped pressure.

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13. Avoid from placing your face/head directly over the well head or wire line valve (BOP) when the cap is off. When lubricator is being pickup from wire line valve stay away from the area to avoid sudden burst of pressure should needle valve is plugged.
14. Prior to starting the wire line power pack be sure to perform the daily maintenance check as per list given.
15. Weekly wire line power pack/reel skid maintenance check must be performed without fail.
16. Check x-mas tree swab valve to be sure it is not passing. If it is passing, please immediately report this to supervisor for rectification.
17. Check the wire log record to ensure the remaining length of wire you have in the drum is sufficient for the next job.
18. Perform a torsion twist test on wire line every time you have to make new rope socket. Be sure it is in good condition within the allowable range.

Refer to Client's Regulations/Rules/Requirements for specific details.

#### **Wireline Operations**

1. Remember to put up the sign "HANDS OFF - WIRELINE IN PROGRESS" on the well you work on to avoid unauthorized manipulation of x-mas tree valve.
2. Open swab, master and wing valves slowly until pressure equalizes.
3. Commit to remember the number of turns required to fully open and close different type of valves on the x-mas tree and always count the turn while opening or closing a valve.
4. Wait for instruction or a signal from the operator before closing any valve on the x-mas tree.
5. When using a bleed off or equalizing hose, be sure the working pressure of the hose is adequate for well pressure. Tie the hose to keep it from whipping.
6. Do not be scared of pressure in the well, but have great respect for it.
7. During the equalizing process of a wire line valve, (ram type) ensure the equalizing port has safety screw and avoid the equalizing screw from backing out or leak.
8. When running the wire in or out of the well, do not allow anyone to perform any work on or near the drum while it is turning.



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9. Do not grab the tool string while it is being picked up into the lubricator.
10. Always keep good blow out plunger in the bottom of the stuffing box. Check stuffing box packing regularly and replace it when worn.
11. During jarring operations keep everyone away from the wire and hay pulley.
12. When working on a high-pressure well, pour the tree and wire line valve full of glycol to keep it from freezing when the well is opened.
13. Keep rags and clothing clear of counter wheel and hay pulley.
14. Use a check valve next to the lubricator or tree when pumping into well.
15. The helper should stand to the side or behind the tree when the tools are entering the lubricator coming out of the hole and listen carefully for the knocking sound when the rope socket hits the stuffing box.
16. Wear earplug or other hearing protection when bleeding pressure off the lubricator or tree.
17. While bleeding lubricator off, stand opposite the needle valves at all times.
18. Do not work after dark without proper lighting.
19. Wear safety glasses when hammering on metal objects.
20. Never hammer or climb on the lubricator while it is being subjected to pressure.
21. When releasing pressure from the lubricator through the needle valve, turn head away from valve and open mouth to prevent damage to ear drums.
22. In making or breaking wire line tools, offset the wrenches in places approximately 6" to 8" apart to prevent mashed fingers, should the wrenches slip or the joint unexpectedly break.
23. Be certain that wire line tool string is in the lubricator before closing master or swab valve.
24. When emptying the sand bailer, wear safety glasses and hold the bailer in a position to prevent sand from blowing to your eye in case the bailer has trapped pressure in it.

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25. If a bottom hole pressure instrument does not come apart easily assume it has trapped pressure and treat it much the same way as sand bailer.
26. Never wash tools and equipment in flammable mixtures in areas without proper ventilation.
27. Keep all hammers, chisels, punches etc. properly dressed to eliminate the possibility of steel particles becoming dislodged. Cold chisels and hammers with “mushroomed” heads have destroyed the sight of a countless number of eyes when small pieces of crystallized metal broken off and stuck the eyeball.
28. Never take shortcut. Follow proper procedures and handling instructions when servicing or redressing tools. Use only the right tool for the right job.
29. Always check and double check tool condition and confirm it functions before running them in well.
30. Check to ensure that you have the right size tools as required by the work program.
31. Use the work-vise when preparing / redressing tool or making rope socket for good stability.
32. After each use, wire line tool must be given prompt service. Always have them ready for next use.
33. Never leave equipment to rust. Provide good protection for all tools, equipment at all times.
34. Any tool or equipment damage during operation is to be reported. Investigate into the failure, troubleshoot them and avoid any form of operational delays.
35. Maintain good team work and clear communication throughout.
36. Do not permit lifting activity over your work area or the equipment.
37. Sensitive electronic equipment or instrument like EMR gauges and other CHS equipment must be handled with great care.
38. Always record maintenance data accurately (wire length, power pack running hours, last date service and etc) and tool inventory, critical spares.
39. Have technical manual available on site for speedy reference.

Refer to Client’s Regulations/Rules/Requirements for specific details.

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#### **Handling Wire Line**

1. Never try to knock the wire protruding from the top of the rope socket with the palm of the hand. Tap it out on a work bench or some other solid surface.
2. When handling wire being fished from well or any time loose ends of wire are encountered, wear safety glasses and take precautions to keep wire from puncturing skin.
3. When the tools are to be cut from the wire line, hold the line securely and make cut approximately 6" from the top of the rope socket, bending the 6" section backward 180 degree. Step back from the lubricator as the wire is drawn through the stuffing box.
4. Use plastic face shield whenever required when handling wire.
5. Never drop weight on wire as this may cause it to be weakened or kinked.
6. Be sure to secure both ends of wire every time you cut it. Do not attempt to handle wire alone – get your colleague to assist you.
7. Do not "Walk" over the wire when it is being lowered or pull out of the hole or while the operator is doing jarring work.
8. Rope off / barricade the area along the path of the wire line to make sure nobody walks over the wire.

#### **Working at height and around X-Mas Tree during wireline Operations**

1. Whenever you are working at height, safety harness must be worn.
2. Do not allow any item or hand tool which you may be working with to fall on those working below you. Secure them using rope or by lanyard.
3. Ensure to have a proper footing when climbing around X-mas tree. Do not grasp any part of the tree that is not properly secured for support.
4. Explain to the crews on the dangers of slipping when working on or around the tree. Help him work out a safe way to work around the tree. Do not use a step ladder to get on and off the tree.

#### **Communications**

1. A clear communication between all personnel involved in the job must be established and maintained throughout the duration of work.
2. Communicate safety to your subordinates and ensure they are fully understood the requirement or procedures related to the operation and equipment or tool.

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3. Demonstrate to the crews on how equipment /tool is to be operated safely.
4. If you doubt the capability of your colleague or subordinate, be sure you give close supervision and guide / train him properly.
5. Make sure you fully understand instructions given by your superior.
6. Wire line operator must double check with the subordinate (WL Assistants) to be sure that the instruction given to them is correctly understood.
7. Wire line operator is responsible for safety of the crew. Follow his instructions and always seek his advice.
8. Maintain a cool composure even under difficult condition. A short tempered or impetuous worker can possibly create an unwanted event.
9. Educate helper on the makeup of the x-mass tree. Show him which valves to open and close. Caution him about no to close a valve on the wire.
10. Report or discuss any issue / finding with your supervisor. Keep people informed of the situation.
11. Keep all crew members well informed of the work plans and discuss with them the work program details.
12. Keep base supervisor / manager informed of your work progress or other issues which needs to be resolved.

**Notification of job completion & Reporting**

1. Notify the company man of the job status. He must be informed if you have completed the job or has it got to be continued.
2. Closed out the permit to work. Report status of the well to company man.
3. Give clear handover on the job status to your relief crew who may be required to continue with the operation.
4. Make sure housekeeping is done well and that the work site is clear and safe from hazards.
5. Highlight any area which you think the client must know regarding the work status or procedures which can enhance safety.
6. Submit your daily wire line report capturing details of activities you have performed.

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### Housekeeping

1. Clear up any slippery surface or oil spill promptly.
2. Do not litter, make use of waste container.
3. Stairways, walkways, passages must be kept clear at all times.
4. Do not scatter tools around. Return all tools to their storage after use.
5. Keep proper inventory of tools and keep them in a proper storage and protect them properly.
6. Lock-up tool box/ tool house when no longer required to be opened.
7. Keep x-mas tree, well bay area and all working areas free from oil, grease or other slippery substance at all times.
8. Keep tools /equipment inside tool house tidy and safe condition- do not leave tool lying around, stored them in their proper storage area / rack.

### Emergency & Safety Drill

Whenever you are responding to emergency or safety drill, be sure to secure your work area safely before leaving the site.

Follow the instructions given by the site supervisor. Know where your muster station and life boat are and know how to get there.

Refer to Client's Regulations/Rules/Requirements for specific details.

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**Subject**                      **Braided line operation Safety**

**General Braided line procedures**

It is recommended to keep all wire spooled in the drum at all time, unless during the rig-up or operations.

Before building a new rope socket, always cut back some wire.

Ensure that sufficient wire was cut back to remove any damage or worn section.

A swivel joint should be place under the rope socket in assist to remove cable or wire torque.

As the wire running in & out the well, any changes in tension cause the torque imbalance between inner & outer armor wires which in turn to cause the tools to rotate.

This torque should be allowed to free itself particularly when running it, otherwise bird nesting or knotting of the wire will result.

*Note: as the cable become more mature and continually spooled onto the drum under tension, the effect of torque imbalance will reduce.*

The wire should be cut back regularly, particularly when the cable has been used continually in wells of similar depth causing differences in diameter between used & unused wire.

**Running in hole**

With the tool string at the top of the lubricator, note position of the cable on the drum & record the depth of each wrap at the flanges on the drum while running it. This will act as secondary depth reference when pulling out of hole, should the depth counter slip or fail.

The tension on the wire should be monitored at all times with increased caution and slower speed when passing through ant restricted diameters/completion assembly particularly when passing through surface tree and tubing hanger where the speed of not more than 30ft/min (10m/min).

Running in speed should not exceed 200ft/min (60m/min) for standard operations.

For plastic coated tubing, max speed permitted is 150ft/min.

While running in, approximately 3gal/hr (11L/hr) should be injected through the grease injection head to maintain an efficient grease seals.

**Jarring**

Prior to commence jarring, the area must be cleared from nonessential personnel.

Pulling weight should be taken prior to latch fishing neck for jarring operation

Multistrand cable should be used for jarring when it is necessary to shear/release the running/pulling tools.

Prior to jarring up, cable should be marked at the counter head with tape as secondary depth reference.

Depth at counter reading/odo meter should be recorded.

During jarring, wire tension should not exceed 80% of the week point rating of the rope socket.

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Careful consideration should be given to condition of the wire and surrounding to avoid unwanted incident to happen.

**Pulling out of hole** Ensure the cable is spooled onto the drum in level wrap under tension. Ensure there is no unauthorized personnel near the rotating wire drum to avoid unwanted incident.  
When pulling out approximately 4 to 5 gal/hr (15 to 19L/hr) should be injected through the grease injection head to maintain efficient grease seals.  
Constant speed should be maintain not exceeding 200ft/min (60m/min)  
Take close watch on wire tension  
Extra caution should be taken when passing through the restricted diameter.  
The grease injection line wiper should be used to remove ant excess grease.

**Swabbing** Is the action required to unload a column of fluid to the surface from a well.

**Swabbing General guidelines** Check and ensure all threaded components of the tool string including the swab cup and mandrels are secure and thigh before run.  
The swab cup should be replaced after every run to ensure efficient seal to lift up column of fluid.  
The tool string should be comprise of sufficient stem to overcome the well fluid and pressure, a swivel fitted under the rope socket, tubular jar to overcome any thigh cup using jar action, knuckle joint and swab cup.  
A check valve should be set in the bottom of the completion tool string prior to running the swabbing tool string.  
Prior to run, open the flow wing valve.

**Minimum Safety requirement for swabbing** Hold a toolbox meeting to discuss swabbing, shut in & well controls strategies.  
Do not subject the swab line to overloading  
Restrict the swabbing activities to daylight hours unless permitted by company & clients (after all safety hazards have been considered).  
Use only depth indicator/odometer & weight indicator which is fully functional.  
Flags **must** be placed on a braided swabbing line to verify footage readings and to stop the swab or bailer at a safe distance from the wellhead control equipment.  
Personnel should not stand near the swab line because it may part or throw slack.  
Report the following swabbing details daily on the wireline well service report:

- Surface shut-in pressure and fluid produced on bleed-off
- Initial static fluid level and maximum depth swabbed
- Feed-in (feet per hour), oil cuts, and number of feed-in checks made
- Hours well was swabbed and total fluid recovered

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Use a disc type of swab cup with an aluminum inner sleeve which is load-regulating and contains no internal metal (wire) bracing.

Use the hydraulically actuated control head and maintain adequate pressure with a hand pump to prevent leakage.

When running a swab assembly into the hole, avoid running into fluid at high speeds because that can cause the line to *bird cage*.

Use sinker bars and rope sockets that permit washing over and fishing.

The lubricator **must** be of sufficient length to accommodate the entire tool string.

A working odometer and weight gauge **must** be present.

Limit fluid loads as recommended by the program and note that larger loads increase the frequency of trouble.

The density and viscosity of the fluid, reservoir assistance, and the condition of the tubing determine the amount of fluid recovered per trip.

***The rule of thumb is a maximum of 500 ft (150 m) of dead fluid or 1,000 feet (300 m) of gas-cut fluid.***

Accelerate slowly and pull the swab assembly at the line speeds (around 500 feet [150 m] per minute) recommended in the approved program when coming out of the hole with a load of fluid.

Do not stop until the swab is in the lubricator and pull the swab at a speed that does not damage the line if the tool string inadvertently hits the control head.

Periodically check the tool string for tightness.

Before and during swabbing operations, shut down all unnecessary engines.

#### Paraffin Cutting basic procedures

Paraffin cutting without pulling the tubing is often performed in two steps:

1. Make short paraffin cutting runs with a paraffin scratcher, and pump or flow the well between runs to clean out the broken pieces of wax.
2. Make short gauge cutter runs to cut the paraffin from the tubing wall and pump or flow the well between runs to clear out debris.

Paraffin cutting offshore requires the following additional guidelines:

1. Since lubricators for paraffin cutting can extend above the top deck, a protective cover is required.
2. A minimum of two mechanical barriers is required between the perforations and the lubricator. These can be:
  - A full opening plug or ball valve located directly beneath the lubricator stuffing box.
  - The down hole SCSSV, if the tools are across the tree.
  - One of the tree valves or a wireline valve, if the tools are down hole.



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3. Establish a direct communication link between the wireline unit and the control room.
4. Ensure that the escape routes from the wireline unit and the well bay are free of obstructions.
5. Use a quick-release fusible lockout device to lock open the surface safety valve.

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<b>Subject</b>	Normal basic safety procedures for Electric line operations
<b>Introduction</b>	This section provides procedures to protect personnel, equipment, and the environment while performing electric line work.
<b>Basic safety guide</b>	<p>The following safety guidelines should be considered in an electric line operation:</p> <p>All equipment used for electric line operations <b>must</b> meet working pressure, construction, and thread criteria and be inspected, tested, and maintained in accordance with industry standards.</p> <p>Valves that are not part of the barrier system <b>must</b> be locked open or secured by other means to prevent the accidental closing and shearing of electric line.</p> <p>A <b>Do Not Close</b> or <b>Do Not Open</b> sign should be posted on each valve. Consider using chain and padlock.</p> <p>Equalize pressure across sand or paraffin bridges, plugs, sliding sleeves, or others by filling the tubing or annulus with fluids and applying pressure as needed.</p> <p>During repetitive operations such as jarring, periodically cut and slip wire to prevent fatigue failure around the sheaves, hay pulleys, and other areas.</p> <p>Jarring with electric line cable is not recommended.</p> <p>To relieve strain on the lubricator, a snatch block or hay pulley should be attached and properly secured to a structural member or the wellhead equipment.</p> <p>Consideration should be given to requiring original equipment manufacturer (OEM) to re-dress setting tools to avoid misfires.</p> <p>When guiding an electric line on a drum, an extension device at least 3 ft (1 m) long <b>must</b> be used to prevent personnel from coming in contact with the line or drum.</p> <p>Do not lift and move equipment around the well while logging operations are ongoing.</p> <p>Avoid closing the master valve during rigging up and rigging down, so that the valve is not damaged by dropped objects.</p> <p>The electric line unit <b>must</b> be operated by authorized and qualified personnel only.</p> <p>The job site should be kept neat and tidy (free of debris, rags, wire scraps, and other materials).</p>

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**Never** place any part of the body in front of a needle valve used to bleed pressure.

**Never** step over or walk under a working electric line.

**Never** work on the front of a logging unit when the reel is in motion.

Hands, fingers, or other parts of the body **must not** be placed between the caliper and caliper gauge rings during calibrations.

All personnel should stay away from the well, electric line, and rear of the electric line unit except when needed for operation.

Conduct electric line operations during daylight hours (preferably), or at night using daylight-quality lighting in critical work-site areas.

When running in the hole or pulling out of the hole, the trip tank should be monitored.

Personnel **must** not stand near dielectric tools at the surface if they are powered up.

Personnel should avoid being near tools while they are being picked up or laid down on the catwalk.

#### Radioactive (RA) Source Precaution

Always be sure to properly secure sheaves and check for worn parts. The following guidelines should be adhered to when handling and running radioactive sources:

- The handling and using of radioactive sources **must** be supervised by the Field Engineer/Logging Engineer.
- All personnel on location **must** be informed when radioactive sources are being used and barriers should be used to keep the area clear.

Refer to Client's requirement/regulation/procedures regarding Radioactive Source for details.

Refer to AELB requirement for storage/handling/operating RA for details.

#### Lost of RA Source

If a radioactive source is lost in the well, take the following precautions:

- Do not produce the well.
- Notify management and the proper authorities of problem.
- Determine the program required to fish the radioactive source, evaluate the chances of success, and submit recommendations to management.
- Get management approval on an urgent basis to alleviate the problem.

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- Fish for the source, plug the well back to above the lost source, or abandon the well.
- Exercise special precautions when fishing for the lost radioactive source.
- Avoid damaging or breaking the source container.
- The following is a typical procedure for securing the well.

#### Lubricators

During electric line operations that require a lubricator, the well valve **must** be closed and the pressure bled from the lubricator before it is un-flanged or removed.

When handling a lubricator, operators **must** follow these guidelines:

- Do not attempt to tighten, loosen, or hammer on a lubricator while it is under pressure.
- Do not attempt lubricator repairs while electric line tools are in the hole.
- Never place hands or feet in a position where the lubricator can injure them.
- Lubricator support should be in position before electric line tools are pulled up.
- Where possible, a platform should be provided to prevent personnel from standing on the wellhead.

#### Conductor or electric line

Conductor cable (electric line) is protected by one or more layers of steel braid or armor.

This braid is usually woven of small steel wires which contain voids that make sealing around the cable difficult.

The larger the diameter of the cable, the more weight is required to run in the hole under pressure.

#### Wire Weak points

Typical weak points are shown in manufacturer's Electric Line Wire Characteristics.

**Refer to manufacturer's manual for wire safety guide.**

Take **caution** to calculate that the weak point is not set too high in deviated wells where the drag on the cable can exceed the weak point setting, thus risking failure of the cable before the weak point setting is reached.

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### Well Control Requirements

The well control requirements incorporate certain basic principles to effectively protect personnel and to prevent unplanned, unexpected pressure releases or well kicks during well work operations. The well control requirements are as follows:

- Prescribed practices **must** be designed so that personnel and public safety are paramount and that environmental protection is provided.
- Preplanned procedures should be designed to rely primarily on hydrostatic pressure for well control during the time a production wellhead is not installed.
- For planned underbalanced operations, due regard **must** be given to ensure that the appropriate and applicable well control procedures and guidelines are provided and implemented.
- Installed surface and subsurface pressure control and containment equipment **must** be designed to confine an influx to the wellbore and to enable controlled removal from the wellbore (either into a formation or to the surface).
- Identified components of pressure control and containment equipment that may be exposed to hydrogen sulfide (H<sub>2</sub>S), carbon dioxide (CO<sub>2</sub>), and other corrosive fluids **must** be designed to resist the harmful effects of these fluids at the anticipated operating pressures and temperatures.
- Pressure containment equipment **must** be installed and operated in a manner to comply with Client's and any applicable governmental regulations.
- Competent supervision **must** be provided to execute the requirements of these requirements.

Refer to Client's requirements/procedures/regulation for details.

### Basic Principles of well control

Well control methods rely primarily on hydrostatic pressure and mechanical barriers for well control when well servicing operations are conducted.

The general principles in establishing and maintaining effective well control and well kick prevention are the Primary & Secondary well control.

### Primary well control

The maintenance of sufficient hydrostatic head of fluid in the wellbore to balance the pressure exerted by the fluid in the reservoir.

Good practice dictates that a sufficient excess of hydrostatic head over the reservoir pressure be maintained at all times to allow for contingencies.

This excess hydrostatic head is referred to as *overbalance*.

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### Secondary well control

If for any reason the effective hydrostatic head of fluid in the wellbore should fall below reservoir pressure, an influx of formation fluid and/or gas (kick) into the wellbore will occur.

When this occurs, the blowout preventers (BOPs) or other pressure barrier control devices **must** be closed to prevent additional fluid and/or gas influx into the wellbore and to reduce the loss of well control fluids from the well.

The purpose of secondary well control is to:

- Allow controlled and safe venting of well fluids and gases at the surface.
- Closing-in the well to allow the necessary well control procedures to be initiated and thus restore the preferred primary well control.

### Basic Wireline Well Control Action Procedures & Drills

The following table lists wireline scenarios for which well control action procedures should be available (if applicable) to deal with incidents if they occur.

This list is not comprehensive and additional scenarios may be used based on the actual wireline planned activities.

Item	Description	Comments
1	Power unit, hydraulics or mechanical failure of wireline surface operating equipment.	
2	Surface equipment circulating system, return fluid system, or fluid pumping failure.	
3	Surface wire line lubricator/pack off head leaks: <ul style="list-style-type: none"> <li>• Leak in wire line pack off head</li> <li>• Leak above wireline BOP</li> <li>• Leak below wireline BOP</li> <li>• Leak in BOP ram or BOP body</li> </ul>	
4	H2S encountered while working on well	Practice in the use of respiratory equipment

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**Basic Wireline well control drills and mitigation procedures**

The drills and training required for wireline crews to mitigate the above well control scenarios should be conducted on a regular basis.

Consult with your wireline supervisor for crew training and competency in the event of the listed well control scenarios.

Also refer to the Client's Production Unit's wireline reference manuals for mitigating or reducing the consequences of well control problems encountered during wireline operations.

Refer to Client's requirements/rules/regulation about well control drills & procedures for detail.

Refer to Client's well control checklist for details.

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**Subject** General / Basic Lifting Safety during Wireline Operations

**Basic Lifting Procedure** Prior to start lifting activities, below are the safety precautions need to be emphasized to prevent occurrence of any unwanted event during lifting process;

No hand on load, use tag line to control the lifting. Nobody is allowed to have direct contact with load at all times during lifting.

Never allow fast pick up or lowering down of load during lifting process.

Only allow authorized personnel within the barricaded area.

Do not work or walk under an overhanging load to avoid being crushed by heavy load in the event of hydraulic system failure or broken slings.

**Loading equipment from base to client yard**

1. Make sure equipment is properly packed; labeled and all loose items are properly secured.
2. Keep a safe distance away (at least 3 meters) from the working area & the forklift fork and do not stand between loads to avoid being struck by object.
3. Only a certified forklift driver may operate the forklift & no DB personnel are allowed to operate 3<sup>rd</sup> party equipment.
4. Make sure the safe working load (SWL) is printed clearly on the tool box or equipment.
5. Appoint only experienced personnel as a signal man to guide loading & lifting activities.
6. Do not work or walk under an overhanging load to avoid being crushed by heavy load in the event of hydraulic system failure or broken slings.

**Unloading equipment from boat to platform**

1. Apply permit from platform authority prior to start lifting activity.
2. Conduct Pre job safety briefing among crew involved with the job to be done, including crane operator and signal man (banks man).
3. Crew to check the space availability and make sure there are no obstructions and dangerous substances around the lifting area.
4. Only a certified crane operator is allowed to operate the crane and carry out lifting.



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5. Use tag line to guide loads and no hand on loads as to prevent injury.
6. Appoint a signal man to guide lifting activity & make sure the signal man is fully competent with crane hand signals.
7. Make sure lifting equipment in good condition and suitable to lift a certain loads as indicated by the equipment SWL.
8. Do not stand between loads and stay away from working area.
9. Be aware of your steps and overhead crane movement.
10. Do not attempt lifting in adverse weather condition.

Refer to Client's Regulations/Rules/Requirements for specific details.

**Wireline Mast /  
High Reach mast**

1. Inspect all lifting gears condition and ensure that MPI for package and lifting sling are still valid (no lifting should be done if any of the items has expired).
2. Prepare and discuss JHA for related job with all parties involved.
3. Prepare lifting permit and get the proper approval as required by the permit before proceeding with the lifting job.
4. Conduct pre job safety briefing and safety meeting with all parties involve.
5. Appoint one personnel as a signal man or use a designated platform roustabout as a signal man. Make sure the appointed signal man is competent with the standard hand signals for crane operation.
6. Observed and avoid all potential hazards during the operation.
7. Give sufficient clearance under or around the load before commencing lifting operation.
8. Ensure all items are properly secured before lifting. Provide tag line on to the load to control the lifting.
9. Do not attempt lifting in adverse weather conditions.
10. Lift the hatch cover for the well to be worked on (destination well) and assign personnel to watch over the opened hatch area. The watchman must ensure no body nears the area.
11. Make sure the path from the original position of the wireline mast to the opened hatch (the well to be worked on by wireline) is not obstructed by any object.

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12. Lift the wireline mast from its original position and skid to the destination well (open hatch area).
13. The watch man from the destination well must now move over to watch the open hatch at the original location of the mast.
14. Spot the wireline mast on the destination well and ensure the hole on the wireline mast grating is properly aligned with the x-mass tree cap.
15. Install the hatch cover on the opened hatch at the original location.
16. No hand on load, use tag line to control the lifting. Nobody is allowed to make a direct contact with load at all times during lifting.
17. Never allow fast pick up or lowering down of load during lifting
18. Only allow authorized personnel within the barricaded area.

Refer to Client's Regulations/Rules/Requirements for specific details.

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**Subject** Basic Safety for Perforation

**Introduction** Perforating involves shooting holes through casing and cement to provide a flow path into the formation. Different sizes and types of guns are used to provide effective flow communication between the wellbore and the reservoir. However, the success does not hinge on perforating equipment alone. For a particular well, the best perforating technique **must** be combined with proper completion techniques to achieve optimum results. If proper techniques are not used, individual productive zones could be severely damaged, erroneously condemned, and possibly abandoned.

**Refer to Perforation procedures/guide & Explosive Safety Manual (ESM) for details.**

**Perforating Equipment's** **Refer to Perforation procedures/guide & Explosive Safety Manual (ESM) for details.**

**Refer to Client's manual/procedures/guidelines for details.**

**Explosive types & classifications** **Refer to Explosive Safety Manual (ESM) for details.**

**Refer to Malaysian Explosive Act for details.**

**Perforating, safety consideration** During the perforating operation the following questions should be addressed:

- Were personnel other than those required to assemble and run the perforating gun instructed to stay a safe distance from the conductor line unit and wellhead area during perforation operations?
- Has the conductor line unit been properly grounded?
- Was the pressure on the casing checked during perforating operations?
- If perforating through casing, is the wellbore filled with a sufficient weight fluid to give adequate overburden?
- Have personnel been notified of the wellhead pressure anticipated after perforating?
- Has the required electronic equipment been shut down?
- For oriented perforating, have charges been made up to fire 180° away from the detector window?
- Has a *before* perforating collar locator log been run and

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correlated with a gamma ray log, and did the collar log include the bottom of the tubing?

- Has an *after* perforating log been run?
- Has the perforating gun been inspected after pulling out of the hole and were all charges fired?
- Are wire snips available for trimming broken un-stranded wire?
- Additional considerations are Checklists:

Electric Wireline Perforating Checklist

Electric Wireline Perforating Explosive Devices Checklist

**Refer to Perforation Procedures/Guide & Explosive Safety Manual (ESM) for details.**

#### Safety practices and precautions

Perforating with applied pressure firing heads is a special case of through-tubing perforating or tubing conveyed perforating and requires the following special precautions:

- Before starting the job, the Team leader/Perforating Specialist/Engineer/Client's Supervisor **must** ensure that all personnel on location understand all safety precautions and procedures.
- Team leader/Perforating Specialist/Engineer will be provided a copy of the procedure for the well, including fluid density in the hole, and directional survey information.
- The Team leader/Perforating Specialist/Engineer will explain the exact procedure for initial setup, preparation, gun arming, going into the hole, firing the gun, and pulling the guns out of the hole.
- The well **must** be dead and not taking fluid.
- Radio and radar silences are not necessary, and voice communications, not hand signals, are required of all personnel.
- No one should be allowed on the rig floor near the wellbore while the gun is being lowered or retrieved except on specific permission of the Client's Supervisor/representative.
- The lubricator **must** be pressure tested before picking up the gun.
- Prior to picking up the gun, all pumps connected to the well **must** have their prime movers shut down, a minimum of one

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valve closed in the pump discharge line, a valve open on the discharge line to rig tanks, and an open line from the well to tanks to relieve any buildup in the wellbore.

- The wellbore pressure **must** be zero (0) before opening the lubricator.
- The gun **must** be at perforating depth prior to starting the rig pumps.
- Never run a pressure-actuated device deeper than its designed depth.
- Fluid levels and pressures should be monitored on all casing and tubing strings during perforating operations.
- When the perforating gun is pulled out of the hole, it is to be inspected by the Team Leader/Perforation Specialist/Engineer/PIC to see if all charges have fired and this is to be reported to the Client's Supervisor/representatives before the all clear is given and the perforating gun is laid down.
- If part of a perforating gun is to be fished out of the hole, the Team leader/Perforating Specialist/Engineer who owning the gun **must** be present when the gun is brought to the surface to inspect and disarm the gun.

**Refer to Perforation procedures/guide & Explosive Safety Manual (ESM) for details.**

**Refer to Client's manual/procedures/guidelines for details.**

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**Hydrogen Sulfide** Hydrogen sulfide (H<sub>2</sub>S) is an extremely toxic gas.

**(H<sub>2</sub>S)**

All personnel who may come into contact with hydrogen sulfide should be intimately familiar with its physical properties and effects. Some of these include:

- Hydrogen sulfide (H<sub>2</sub>S) is a colorless gas with a powerful nauseating smell of rotten eggs.
- The odor is a poor warning property because hydrogen sulfide exposure quickly deadens the sense of smell.
- The gas is heavier than air and may collect in low areas such as sewers, pits, tunnels or gullies.
- High airborne levels of hydrogen sulfide (between 4.3 and 46.0 percent of gas by volume in the air) may catch fire if there is a source of ignition.
- If the gas is burned, toxic products such as sulfur dioxide will be formed.

**H<sub>2</sub>S health effect**

Hydrogen sulfide is extremely toxic. It may cause death instantaneously in high airborne concentrations. Low levels may be extremely irritating to the lungs, nose, throat and eyes.

Hydrogen sulfide can be detected by smell at levels as low as 0.13 parts hydrogen sulfide per million parts air (ppm).

Odor cannot be used as a warning because the gas can deaden the sense of smell within 2 to 15 minutes in exposures of approximately 100 ppm.

LOW	0 - 10 ppm	<ul style="list-style-type: none"> <li>• Irritation of the eyes, nose and throat</li> </ul>
MOD	10 - 50 ppm	<ul style="list-style-type: none"> <li>• Headache</li> <li>• Dizziness</li> <li>• Nausea &amp; vomiting</li> <li>• Coughing &amp; breathing difficulty</li> </ul>
HIGH	50 - 200 ppm	<ul style="list-style-type: none"> <li>• Severe respiratory tract irritation</li> <li>• Eye irritation / acute conjunctivitis</li> <li>• Shock</li> <li>• Convulsions</li> <li>• Coma</li> <li>• <b>Death in severe cases</b></li> </ul>

**Where you will find H<sub>2</sub>S**

Refer to client's information for H<sub>2</sub>S locations.

**H<sub>2</sub>S Personnel safety provisions**

All personnel should undergo an eardrum examination before assignment to H<sub>2</sub>S prone areas.

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In the event of an H2S alert, personnel with perforated eardrums should be prohibited from working in an H2S environment.

The following training program will be implemented for all site personnel who may be exposed to H2S levels in excess of 10 ppm.

Training should include:

- All personnel working on H2S sites **must** have accredited H2S training.
- All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis **must** be informed as to the hazards of H2S.
- Also, they **must** be instructed in the proper use of personnel safety equipment including breathing equipment (both self-contained and supplied air systems) which they may be required to use, and be informed of H2S detectors and alarms, ventilation equipment, prevailing winds, briefing areas, warning systems, and evacuation procedures.
- They **must** be informed of tasks and locations with potential H2S exposure.

#### **Personnel responsibility**

All personnel have the following responsibilities:

- Familiarize themselves with the procedures outlined in this manual, and to know what their role is under any operating condition.
- Attend the daily safety meeting.
- Attend to their personal safety first.
- Help anyone who may be injured or overcome by toxic gases. Remember, put breathing equipment on before helping anyone overcome by H2S, then get them to a safe area and administer oxygen.
- Under emergency conditions, report to the designated Safe Briefing Area and follow the instructions of the Client's Supervisor or Person in Charge.

Refer to Client's regulation/procedures for details.

#### **Sulfur Dioxide (SO2)**

SO2 is a colorless gas with a pungent, burned match, or rotten egg odor.

SO2 has a strong odor at low level, which increases with higher concentrations.

It is heavier than air and will settle in low areas. It is not flammable.

SO2 is commonly present in sour gas flares.

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SO<sub>2</sub> is produced during the burning of H<sub>2</sub>S.

Although SO<sub>2</sub> is heavier than air, it will be picked up by a breeze and carried downwind at elevated temperatures.

**SO<sub>2</sub> Health hazard** SO<sub>2</sub> is extremely irritating to the eyes, mucous membranes, and upper respiratory tract, thus it has exceptionally good warning powers in this respect.

At a concentration of 100 ppm, SO<sub>2</sub> is immediately dangerous to life and health.

SO<sub>2</sub> in combination with moisture (including perspiration), will form sulfurous acid.

Moist skin affected by SO<sub>2</sub> **must** be washed immediately.

LOW	0 - 2 ppm	<ul style="list-style-type: none"> <li>• Threshold limit value, time-weighted average:</li> <li>• Is safe for 8-hour workday exposure without adverse</li> </ul>
MOD	10 - 20 ppm	<ul style="list-style-type: none"> <li>• Maximum recommended exposure for 8-hour period.</li> <li>• Eye irritation occurs at approximately 20 ppm.</li> </ul>
HIGH	50 - 100 ppm	<ul style="list-style-type: none"> <li>• Maximum concentration for 1/2 to 1 hour exposure.</li> <li>• At 100 ppm SO<sub>2</sub> is immediately dangerous to life and health.</li> </ul>

**SO<sub>2</sub> environ PPE** Personnel who respond to incidents where SO<sub>2</sub> may be present **must** avoid contact by wearing personal protective equipment including respiratory protection.

**Carbon Dioxide (CO<sub>2</sub>)** This section provides procedures and equipment that protect personnel, equipment, and the environment when working with carbon dioxide (CO<sub>2</sub>).

CO<sub>2</sub> presents the inherent dangers of low temperature metal failure, asphyxiation, ice plugs, and requires special guidelines.

CO<sub>2</sub> is normally found in the atmosphere at a concentration of approximately 330 ppm.

Gaseous CO<sub>2</sub> is heavier than air, colorless, odorless, and nonflammable.

**CO<sub>2</sub> Physical Hazard** CO<sub>2</sub> will displace oxygen and can create an oxygen-deficient atmosphere.



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Trapping liquid CO<sub>2</sub>, gaseous CO<sub>2</sub>, or a combination of the two in a line **must** be avoided because the normal warm-up of a line can cause excessive pressure and pipe failure.

**Performing job  
safe guide**

The following guidelines and requirements should be noted when actually working with CO<sub>2</sub>:

- Leaks that develop after introducing liquid CO<sub>2</sub> should be allowed to continue leaking if they do not jeopardize the integrity of the job.
- If a severe leak develops, the job should be shut down immediately.
- Since high concentrations of CO<sub>2</sub> can cause suffocation, protective personal breathing gear should be available.
- Proper PPE should be worn around leaking CO<sub>2</sub> piping due to the extremely cold temperatures, which result from expansion effects at the leak.
- Never shut in a line filled with liquid CO<sub>2</sub> without venting, because it can build up sufficient pressure to rupture the line.
- Never vent liquid CO<sub>2</sub> at a high point in a line because dry ice will form and can block the lines causing the trapped liquid to over pressure if the line warms up.
- Liquid CO<sub>2</sub> should not be pumped into the well until it has been mixed with the treating liquid, because the low temperature of the CO<sub>2</sub> could cause metal failure in the wellhead connections or piping.

If there is a suspected CO<sub>2</sub> release, the following steps should be taken;

- Oxygen level should be monitored to ensure safe conditions exist in the area.
- Personnel should avoid ditches, bell holes and ravines in the area.
- If necessary, evacuation should be upwind.

**Mercury (Hg)**

Mercury and most of its compounds are extremely toxic and are generally handled with care.

In cases of spills involving mercury specific cleaning procedures are used to avoid toxic exposure. It can be inhaled and absorbed through the skin and mucous membranes, so containers of mercury are securely sealed to avoid spills and evaporation.

Heating of mercury, or compounds of mercury that may decompose when heated, are always carried out with adequate ventilation in order to avoid exposure to mercury vapor. The most toxic forms of mercury are its organic compounds, such as dimethylmercury and methyl mercury.

However, inorganic compounds, such as cinnabar are also highly toxic by ingestion or inhalation of the dust. Mercury can cause both chronic and acute poisoning.

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**Hg health hazards** Mercury is dangerous and **must** be handled with great care. Health effects of mercury and guidelines for personnel exposed to mercury are:

- Mercury can be absorbed through the skin or inhaled in the liquid form.
- Inhalation of mercury vapors may cause headaches, coughing, chest tightness, and breathing difficulty.
- Repeated or prolonged exposure to mercury can adversely affect the kidneys and nervous system.
- Individuals working with mercury should have a periodic urinalysis.
- If mercury is handled, personnel **must** wash their hands thoroughly before eating or smoking.
- Personnel **must** not eat meals in rooms where mercury is handled or stored.

**Hg exposure standard** The exposure standard that is important for well work personnel is the threshold limit value (TLV).

TLV is only applicable for Hg concentration or level in the air or atmosphere for breathing.

TLV is not applicable to determine the exposure level of Hg in the liquid streams or in solid state, such as sludge, through skin contact or ingestion.

The TLV limit as specified by the Department of Occupational Safety and Health (DOSH) for exposure to Hg vapor or gas is either of the following:

- The TLV is an exposure of 25 ppb (0.025 mg/m<sup>3</sup>) over an 8-hour exposure.
- The TLV is an exposure of 75 ppb (0.075 mg/m<sup>3</sup>) for a 15-minute exposure.
- An instantaneous atmospheric reading does not represent the actual exposure to a person per the TLV, but is a means to determine the required level of protection.

Hg concentrations as another exposure standard. The current in-stream action levels are:

- **Vapor or gas stream:** 8 ppb (0.03 mg/m<sup>3</sup>)
- **Liquid stream:** 30 ppb (0.03 mg/L)
- **Solid:** 30 ppb (0.03 mg/kg)

In-stream Hg concentration is normally used to quantify the level of Hg in the common process stream:

- The common process streams with data available are gas, crude, condensate, produced water and pigging sludge.
- 30 ppb is the concentration of Hg in the process stream where

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there is a potential of significant accumulation in the equipment or their contents, which could affect their integrity.

**Hg exposure monitoring**

Personal exposure monitoring is done to determine the levels of exposure to the workers.

Types of personal exposure monitoring include:

- 8-hour exposure for identified worker groups
- Duration of the tasks for identified tasks

**Medical Surveillance**

Medical surveillance is conducted for employees exposed to Hg above the threshold limit values (TLVs) of:

- 25 ppb (0.025 mg/m<sup>3</sup>) for 8-hour time weighted average.
- 75 ppb (0.075 mg/m<sup>3</sup>) for 15-minute duration.
- Arrangement for medical surveillance is coordinated by Medicine and Occupational Health (MOH).
- Medical surveillance is conducted by the Occupational Health Doctor at a appointed clinic.

**Hg basic First Aid action**

**Eye:** Wash immediately with eye wash or large amounts of water. If irritation persists, get medical attention.

**Skin:** Wash immediately with soap or mild detergent and water. If irritation persists, get medical attention.

**Inhalation:** Move the person to fresh air at once. If breathing has stopped, clean contact area (mouth and nose) and perform artificial respiration. Keep warm and at rest. Get medical attention immediately.

**Ingestion:** If the person is unconscious, induce vomiting. Get medical attention immediately.

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Subject	Area classification	
<b>Malaysian / European Classification</b>	Following is the Malaysian and/or European classification system:	
<b>Hazardous area</b>	<p>An area in which a flammable atmosphere is, or may be expected to be present.</p> <p>Special precautions and/or requirements for the equipment / tools / engines / electrical fittings / etc. are necessary.</p> <p>There are three hazardous are zones :- 0, 1 &amp; 2</p>	
<b>Zone 0</b>	That part of a hazardous area in which a flammable atmosphere is continuously present or present for long periods of time.	
<b>Zone 1</b>	That part of a hazardous area in which flammable atmosphere is likely to occur in normal operations.	
<b>Zone 2</b>	That part of a hazardous area in which flammable atmosphere is not likely to occur in normal operations, and if it occurs, will exist only for a short period of time.	
<b>Non-Hazardous area</b>	<p>An area in which flammable atmosphere is not expected to be present.</p> <p>Special precautions and/or requirements for the equipment / tools / engines / electrical fittings / etc. are not necessary.</p>	
<b>North American Classifications</b>	The North American hazardous area classification system is as follows:	
<b>Classification</b>	<p>Developed by the National Electric Code (USA) , the degree of hazard is expressed by three (3) part classification code:</p> <ol style="list-style-type: none"> <li>1) Class</li> <li>2) Division</li> <li>3) Group</li> </ol>	
<b>Classes</b>	<b>Class 1</b>	An area which flammable gasses or vapor are present in the air in sufficient quantities to produce an explosive or ignitable mixture.
	<b>Class 2</b>	An area which combustible or electrically conductive dusts are present.
	<b>Class 3</b>	An area which ignitable fibers or fillings are present, but in quantities unlikely to produce ignitable mixtures.

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**Division**

Division 1      An area in which hazardous concentrations are continually present under normal operation conditions.

Division 2      An area which hazardous concentrations are handled or processed with in closed containers, from which they can escape only when accidentally ruptured or broken.

**Groups**

The group classification refers to the type of hazardous materials.

Group A      An atmosphere containing acetylene.

Group B      An atmosphere containing hydrogen, gases or vapors.

Group C      An atmosphere containing ethyl-ether vapors ethylene or cyclo-propane.

Group D      An atmosphere containing gasoline, hexane, naphtha, benzene, butane, propane, alcohol, acetone, benzol, lacquer solvent vapors or natural gas.

Group E      An atmosphere containing metal dust, including aluminum, magnesium and their commercial alloys, and other metals of similar hazardous characteristics.

Group F      An atmosphere containing carbon black, coal or coke dust

Group G      An atmosphere containing flour, starch or grain dust.

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**Subject**                      **Wireline Fishing Safe Guide**

**Minimum  
safety  
requirement  
guidelines**

The following minimum safety requirements **should** be met when fishing:

The appropriate BOP equipment **must** be installed and tested in accordance with:

Determine whether the proposed fishing operation is justified, and if so, a management approved fishing program **should** be obtained.

It should be noted that fishing is as much art as it is science and deviations from an established program are normal.

Good judgment, creative thinking, careful planning, and an analytical approach are all prerequisites for a successful job.

All safety equipment and precautions should be in place and used.

At no times should any unsafe practices be employed.

All work permits and authorization should be strictly adhered to.

The planned schedule for the fishing operations should be strictly adhered to.

Ensure all the equipment required is available and in working order prior to starting the operation.

All reporting procedures are adhered to. This requires all actions taken and tools used with all the data required being accurately logged and reported.

All handovers between shifts or crews are carried out in full and expeditiously.

All handovers **must** be in writing.

Patience and good working practices are required throughout the duration of the fishing operations. Short cuts or poorly planned operations only lead to further problems.

A toolbox meeting should be conducted and documented with all relevant personnel prior to the start of the operation. The meeting should be repeated at each shift change.

Before commencing a fishing job, the Wireline Operator/Specialist should discuss the following with the Client's Supervisor/Authority:

- The fishing program, including tools to be run
- Condition of the wellbore

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- Location and complete description of the fish
- Possible adverse conditions, such as a differential pressure across the fish.
- Tubing size and type of tools to run
- Fishing tools and other equipment available

Review the history of previous wireline work on the well and make note of tight spots, doglegs, obstructions, or other difficulties encountered.

Be wary of well control problems when removing the fish and pulling tools from the lubricator.

Use only wireline that is in good condition and is free of kinks and worn or broken strands.

All wireline tools and equipment **must** be in good condition.

The weight indicator must be reliable.

Ensure the lubricator has sufficient length to contain the total length of the fishing tools and the recovered tools when pulled to the surface.

Remove the line from the odometer sheave during any extended jarring operations at any one depth.

Frequently check tools for tightness.

Run a drift diameter gauge to top of the fish.

Be cautious of possible pressure trapped below the fish.

Do not run a fishing tool without any releasing capability or a shear sub.

Do a surface test on pulling to ensure pin shears before running in hole.

The fishing tool **must** have a compatible pulling tool.

If tools become stuck while fishing, fill the wellbore with fluid, if possible, and drop a cutter bar to cut the line at the rope socket or attempt to strip over the fish.

Be cautious of possible pressure trapped below the fish.

If wireline is left in the hole, estimate the fallback (dependent upon the tubing size and diameter of the wire being used), fill the wellbore with fluid, and locate the top end of the wire with a wire finder or a wireline spear.

When pulling a fish, the Wireline Operator should stop the unit as the fish nears the surface and check to see if it can be lowered.

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This safety check is necessary to avoid pulling a fish up into the Christmas tree or lubricator that cannot be lowered if necessary.

Keep all unnecessary personnel away from the fishing operation.

When wireline is left in hole, locate the top end of the wire with a full-bore gauge ring or wire finder, before attempting to pull it. This is to avoid running the wire-grab tool string past the parted wireline, in which case the parted wireline could ball up above the wire grab tool string and cause the tool string to become stuck with the parted wire.

A wireline spear should be run slowly and cautiously, noting the following:

- If the spear engages the line below the top of the line, the line can ball up above the tools and become stuck.
- It may be necessary to run a full gauge ring or wire-finder to ball up the wire in order to catch it with the wireline spear.

However, balling up the wire may complicate the fishing work and should only be done with the approval of the Client's Supervisor / Authority.

Report all recovered fish on the wireline well service report.

When tools are left in the hole, submit a detailed description and sketch with dimensions and depths.

Refer to DB Operation Manual/Guide and Client's requirements for details.



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**Subject**                      **Working at height**

**Minimum safety requirement guidelines**

This procedure summarizes some key aspects of the legislation and Codes of Practice specific to the construction industry and associated trades to encourage the highest possible level of health and safety when working at height.

**Risk Assessment associated to safe working at height**

Risk assessment allows appropriate control measures to be developed. Once hazards have been identified, they should be assessed in terms of their risks to incur an injury.

To assess risk, consideration should be given to the:

- likelihood that injury will occur
- severity of the injury should it occur.

Factors to consider when assessing the likelihood and severity of risk that may cause a person to fall include:

- condition of the work surface, e.g. an uneven surface or a surface with unprotected edges which are not identified or are difficult to see
- bad weather conditions, e.g. heavy rain or wind
- number of people who may be at risk
- location of the work area
- location of access routes
- type of work to be carried out
- work practices in use
- scheduling of work
- type of plant, machinery and equipment to be used
- training and experience of the people carrying out the work
- sudden acceleration or deceleration
- moving from one surface to another
- capability of the surface to support the load
- change of levels
- loss of hand grip
- type of footwear
- equipment, tools, or rubbish obstructing work areas
- incorrect use of ladders
- clothing catching
- moving surfaces
- lighting
- likelihood of being struck by a moving or falling object.

**Specific control measures**

The risks associated with working at heights must be controlled. The following control measures are listed in the order in which they must be applied as follows: -

1. Temporary work platforms  
Risks must be controlled through the use of stable and securely

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fenced work platforms (such as portable work platform).

## 2. Guardrails

Guardrails should only be used in situations when it is not reasonably practicable to use temporary work platforms.

## 3. Fall arrest systems

Fall arrest systems should only be used in situations when it is not reasonably practicable to use either temporary work platforms or guardrails.

### Hazards associated to Safe working at height

Potential hazards listed below should be noted in the use of connecting hooks in both fall-arrest and suspension applications

1. Latch may not close or may not lock:
  - Due to weakened spring
  - When caught on clothing
  - Due to corrosion or other contamination, which prevents free movement
  - Due to bent latch, which prevents free movement
2. Dynamic rollout may occur on some hooks. A twisted lanyard or pole strap may cause the connecting D-ring to rest on and load the latch. If pressure is accidentally applied on the locking lever, the latch will open and release the connector.

### Requirements for the use of fall arrest systems

- All anchorage points for the device are inspected by a competent person before their first use and then on a regular basis so that they are capable of supporting the design loads. In addition, the user should carry out a visual inspection before every use.
- If the load bearing capacity of an anchorage point is impaired, the anchorage is immediately made inoperable so as to prevent its use.
- Any harness, safety line or other component of the device that shows wear or weakness to the extent it may cause the device to fail is not used.
- All persons using the device have received training in the selection, assembly and use of the system.
- Adequate provision is made for the rescue of a person whose fall is arrested by a fall arrest device

### Objects falling from heights

It is important to consider the risks associated with objects falling from heights.

- An employer to provide a safe means of raising and lowering plant, materials and debris in the place of work.
- A secure physical barrier to be provided to prevent objects falling freely from buildings or structures in or in the vicinity of the workplace.

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- Where it is not possible to provide such a barrier, the provision of measures to arrest the fall of objects. These measures may include the platform of a scaffolding system or certain types of other roof edge protection systems, or the careful positioning of a toe board that forms part of the guardrail, or the use of appropriate infill panels to the guardrail.
- Personal protective equipment to minimize the risks associated with falling objects.

#### **The safe use of portable ladders**

A ladder is used for gaining access to areas above or below the ground or other levels not provided with permanent access.

When using portable ladders, the following suggestions for controlling risk should be considered:

- Use the correct ladder for the job.
- Use only industrial ladders – do not use domestic ladders.
- Examine ladders for defects and damage before use.
- Ladders should be adequately supported at the base.
- Set the ladder at a slope of 4 in 1 – ladders must be angled one out and four up.
- Ladders should extend at least one meter above the access level.
- Ladders should be firmly secured or tied off or held firmly by another person.
- The ties should be attached to the stiles of the ladder and not the rungs.
- A ladder should not be “walked” by the person standing on the ladder.
- One person on a ladder at a time with three body limbs on the ladder at all times.
- Do not climb higher than the third rung from the top of the ladder.
- Only work on a job within easy arm’s reach from the ladder.
- Ladders (other than trestle ladders) should not be used to support planks as a work platform.
- Metal ladders or wire reinforced ladders must not be used where electrical hazards exist.
- Climb and descend facing the ladder maintaining three points of contact with the hands gripping the stiles or each rung.
- Do not carry anything in your hands when climbing or descending.
- Do not place ladders in vehicle or pedestrian traffic areas.
- Long and heavy ladders (greater than 20kg) should be handled by at least two people.
- Stepladders should only be used in the fully open position.
- Wear slip resistant footwear when using ladders.
- Clean off footwear and ladder rungs before using the ladder.

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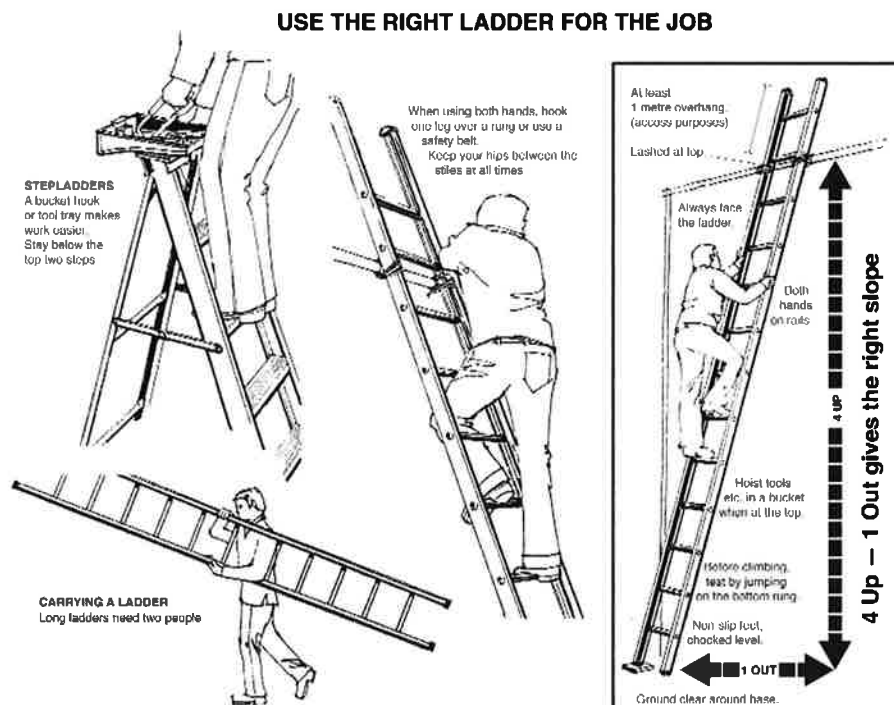


Figure 1: Right Ladder for the job

## Working Environment

### a. LIGHTING

Lighting at the workplace should be not less than:

- 200 lux for a working area
- 50 lux for stairs or other areas providing access to a working area.

### b. HOUSEKEEPING

Materials, tools and equipment on working platforms should be stored so as to leave at least 450 mm clear access.

### c. WEATHER CONDITIONS

Exposure to the weather should be given consideration when establishing the area for an access way.

For example, rain may make surfaces slippery or strong winds may cause loss of balance.

### d. WARNING SIGNS

Warning signs should be erected to warn persons of the risk of falling from a height. The signs should be positioned where they will be clearly visible to persons working in the area.

## Safety Harness

A harness system enables a person to be positioned and safely supported at a work location for the duration of the task being undertaken at height.

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Harness systems are used for gaining access to, and working at, a workplace where there is a risk of fall. The most common harness systems include:-

- **Total restraint systems**  
The preferred harness system for working at height is the **total restraint system**. This system protects a user from approaching an unprotected edge, thereby preventing a free fall from occurring.
- **Fall arrest systems**  
A fall arrest system is designed to support and hold a person in the event of a fall. It is not a work positioning system as they are not designed to support a person while working.

Only when total restraint is impractical, should a fall arrest system be considered. Fall arrest is a minimization measure as it does not prevent the fall from occurring. These systems require a higher level of operator competency and supervision.

A fall arrest system is an assembly of interconnected components consisting of a harness which is connected to an anchorage point by means of a lanyard incorporating an energy absorber. They can be used where workers are required to carry out their work near an unprotected edge.

When fall arrest systems are used an appropriate safety helmet shall be worn to protect the worker from head injury during an uncontrolled fall (figure 2).



Figure 2: Fall Arrestor

- **Work positioning systems**  
Work positioning systems enable a person to work supported in a harness under tension in a way that a fall is prevented. Generally the arrangement allows for the worker to maintain a stable position and to work hands-free while completing a task. The harness arrangement should not allow a fall of more than 600 mm. This is generally achieved through the use of short lanyards of 300 mm.



Figure 3: Safety Harness



Figure 4: Double Lanyard

Refer to DB Operation Manual/Guide and Client’s requirements for details.