



Chapter 9 ERW Storage &

Transportation Procedures

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1. Introduction

Clearance task operations: Explosives are required to destroy UXO found at the clearance site or during roving task operations. In carrying out clearance task operations, it is

necessary to move, transport and store explosives properly to ensure safety.

2. Scope

This section of the standard operating procedure covers the storage, transport and handling of explosives for the operations of Silavan UXO Survey Clearance and Ordnance Disposal Company Limited (abbreviated as SLV) operating in the Lao PDR.

3. Environmental conditions for explosive storage

The explosives used in the operations of Silavan UXO Survey, Clearance and Ordnance Disposal Co., Ltd. (abbreviated as SLV) are deposited with the military depots of the provinces or districts where the company operates. However, sometimes the company may need to collect explosives for its own operations, especially for site clearance tasks, because it is necessary to destroy the discovered UXOs every day.

General recommendations for the construction of explosives storage facilities, including temporary explosives storage facilities at clearance sites, are as follows:

- a. Store in a dry and well-ventilated place.
- b. Store in a cool place and avoid sudden and frequent temperature changes.
- c. Avoid direct sunlight.
- d. Store away from places with strong and continuous vibration.

4. Safety distances for explosives storage depots

The minimum safety distances between explosives storage depots and residential buildings, highways and other ammunition depots used in the Lao PDR are specified in the appendix to this section of the standard operating procedure.

4.1 Explosive Storage Limits

In the case of the operations of Silavan UXO Survey, Clearance and Ordnance Disposal Company Limited (abbreviated SLV), it is necessary to store explosives for use in its operations. The number of explosives to be stored is based on the requirements set out in the document, which is copied from Chapter 22 of the National Standard.

4.2 Fire Prevention

The fire prevention requirements for permanent explosive's storage facilities are set out in Appendix B to this section of the Standard Operating Procedures.

Items prohibited from being stored or brought into an explosive's storage facility.

Appendix B to this section sets out a list of items or objects that are prohibited from being brought into or kept in a permanent explosive's storage facility.

Security

The minimum requirements for the security of a permanent explosive's storage facility are as follows:

- a. Permanent explosive's storage facilities must be maintained and guarded at all times.
- b. Lighting must be installed to illuminate the area around the permanent explosive's storage facility to ensure safety at night.

- c. The person in charge of the explosive's storage facility must be the custodian of the keys and must strictly control entry and exit to the explosive's storage facility.

4.3 Items prohibited from being stored or brought into explosives storage facilities.

The appendix to this section sets out a list of items or materials that are prohibited from being brought into or stored in permanent explosives storage facilities.

4.4 Security

The minimum requirements for the security of a permanent explosive's storage facility are as follows:

- a. The permanent explosives storage facility must be maintained and guarded at all times.
- b. Lighting must be installed to illuminate the area around the permanent explosive's storage facility to ensure safety at night.
- c. The person in charge of the explosive's storage facility must be the custodian of the key to the facility and must strictly control entry and exit to the facility.

5. Explosives storage facilities at the clearance site

Explosive's storage facilities at the clearance site are used for the temporary safe storage of explosives and safe UXO, which can be moved around. Such facilities shall be established at the clearance site or temporary offices at the clearance site. Explosive's storage facilities at the clearance site shall comply with the following requirements:

- a. The maximum quantity of explosives permitted to be stored at the clearance site shall not exceed 50 kg.
- b. Explosive's storage facilities at the clearance site shall comply with the environmental conditions for explosives storage as specified in Section 3 above.
- c. The minimum safety distances for explosive's storage facilities at the clearance site shall be as follows:
 - (1). The safety distance between the explosive's storage facilities at the clearance site and other explosive's storage facilities, command posts and management posts shall be 30 meters.
 - (2). The safety distance between the field explosive's storage facility and other locations such as residential buildings or roads with traffic shall be in accordance with the safety distance specified in the Appendix A to this Section.
- d. There shall be fire extinguishing equipment near the storage facility such as fire extinguishers, sand buckets, etc.
- e. There shall be a sign in Lao that says "No smoking within 30 meters".
- f. No UXO shall be stored in the same storage facility as the field explosive's storage facility.
- g. Grass and bushes within 20 meters of the field explosive's storage facility shall be kept short.
- h. Field explosive's storage facilities shall be located in a location that can be monitored and observed at all times.
- i. Fuel, oils, lubricants and other flammable materials shall not be stored in the field explosive's storage facility.

Explosives to be used in field operations of Silavan UXO Survey Clearance and Ordnance

Disposal Company Limited (abbreviated as SLV) are permitted to be stored in vehicles, that provided vehicles are not used for administrative purposes or as ambulances.

6. General requirements for the storage of explosives

Silavan UXO Survey, Clearance and Ordnance Disposal Company Limited (abbreviated as SLV) shall strictly adhere to and comply with the following requirements:

- a. Explosives shall not be stored in residential areas or in buildings or offices.
- b. Detonators shall be stored in a separate warehouse, separated from other explosives. Alternatively, detonators may be stored in the same warehouse as explosives, but detonators and explosives shall be separated by a pressure-proof barrier, which may be a layer of sandbags or others barriers.
- c. Storage and transportation of electrical detonators: Detonators shall be in their original containers or in suitable packs that can protect against radio frequency waves.
- d. Explosives shall be stored in the most suitable packages or containers. Such as factory-made packages or containers in which explosives are stored. Do not store explosives without packing them tightly in their packages or containers.
- e. The arrangement of explosives in the packages or containers must be orderly and tightly so that the explosives in the containers cannot move.
- f. Do not store other objects with explosives. This does not include tools for opening explosive containers or packages.
- g. Explosive storage areas are for storing explosives only. Do not use this area for other purposes such as shelters or recreation areas.
- h. If repairs are necessary to an explosive storage area, all explosives must be moved to another safe location before the repairs is made.
- i. Do not store the unused explosive containers or packaging materials in the explosive storage areas. Do not remove explosives from containers or packages until they are ready to be used. The number of packages opened and used should be kept to a minimum.
- j. Explosives should be stored in a manner that allows the first received explosives to be used first. Date marking on the packages or containers is a way to help identify which explosives should be used first.
- k. Explosives should be stored above or above ground level on pallets, boards or shelves. Parts of explosives stored in the field should be stored high off the ground.
- l. Explosive containers should be stored tidy up for layers in a secure manner.
- m. Cardboard boxes that may be damaged or torn should not be stored for layers.
- n. There should be sufficient ventilation above and around the boxes to allow air to circulate freely in the explosive's storage area.
- o. Personnel responsible for the maintenance of explosives storage should be trained in the proper handling and storage of explosives.
- p. Only authorized personnel may enter explosive's storage areas.

7. Transportation of Explosives

7.1 Minimum Requirements for Transportation of Explosives

All transportation or movement of explosives for the operations of Silavan UXO Survey Clearance and Ordnance Disposal Company Limited (abbreviated as SLV) shall comply with

the following requirements:

- a. When traveling, convoys of vehicles carrying explosives shall maintain a minimum distance of 200 meters between each vehicle.
- b. All vehicles carrying explosives shall take the following precautions to prevent the spread of fire:
 - (1) A 2 kg fire extinguisher that is still operational shall be kept in the driver's compartment.
 - (2) Smoking shall not be permitted inside the vehicle or within 30 meters of the vehicle carrying explosives.
 - (3) Fuel shall not be stored anywhere inside the vehicle except in the fuel tank.
 - (4) No lighters, matches or other flammable materials shall be brought to the vehicle carrying explosives.
 - (5) Vehicles carrying explosives must be equipped with grounding to dissipate static electricity.
- c. Explosives vehicles must not be left unattended. If the driver must leave the vehicle, a follower (co-driver) must be present to watch the vehicle.
- d. Vehicles used to carry explosives must:
 - (1) Be ready to operate, have a spare tire, and a set of keys for changing tires.
 - (2) Be suitable for the load to be carried and for all road conditions to be traveled.
- e. Vehicles carrying explosives must be accompanied by a follower (co-driver). The driver and co-driver must:
 - (1) Be trained in the proper handling and transportation of explosives.
 - (2) Be in possession of a Lao PDR driver's license for the type of vehicle they will be driving.
 - (3) Be familiar with the types of explosives to be carried and the specific hazards associated with those explosives.
- f. Passengers are not allowed to lead vehicles carrying large quantities of explosives.
- g. Explosives must be in containers and should be in the original containers from the factory. The explosives must be arranged in an orderly manner so as not to move around in the container or its contents. When explosives are transported in containers other than their own containers, the containers must be clearly marked as follows:
 - (1) The word "explosives" must be written on the container
 - (2) The contents of the container must be indicated
 - (3) The weight or quantity of the explosives contained in the container must be indicated.
- h. The requirements for the carriage of explosives are as follows:
 - (1) If practicable, explosives must be transported in specially designated vehicles. If it is necessary to transport explosives and other items in the same vehicle, the explosives and other items must be stowed in an orderly, secure and safe manner to prevent any danger from the movement of the items.
 - (2) Explosives shall be arranged in a uniform manner throughout the vehicle and shall not exceed the height of the sides of the vehicle.
 - (3) Explosives to be transported shall be securely fastened to prevent movement during transport.
 - (4) Explosives transported in open-top vehicles shall be covered with a tarpaulin sheet or other material to prevent the explosives from becoming wet.

(5) Detonators shall be stored in a steel container. The container may be stored in the driver's compartment of the explosives truck to separate the detonators from the explosives. However, if possible, the detonators shall be transported in a separate vehicle.

(6) Loading or unloading of explosives shall be carried out only in a designated explosive storage area and, unless exceptional circumstances arise, loading or unloading of explosives shall be carried out only during daylight hours.

- i. The speed of vehicles transporting explosives shall not exceed 80 km/h. Drivers carrying explosives should avoid sudden stops or braking.
- j. Explosives should not be transported at night. If a vehicle carrying explosives needs to stop at night and the explosives remain in the vehicle, a guard must be set up during the night.

7.2 Transportation of explosives for daily use

Transportation of explosives for the daily operations of the company must be secured in protective containers. The container containing the detonators for daily use must be made of steel or wood. Detonators stored in protective containers must be in their original packaging or in packaging that prevents the detonator from moving or being moved. Detonators with a damaged appearance must never be transported in a container.

7.3 Transporting unexploded ordnance that is safe to move

The operations of Silavan UXO Survey, Clearance and Ordnance Disposal Company Limited (abbreviated as SLV) will only move UXO in the event that the company's qualified explosives disposal technicians, as defined in Chapter 8 of the National Standard on **"Explosive Ordnance Disposal"** have proven and certified that it is safe to move.

Except for UXO that is still in its original packaging. The safe movement of UXO shall comply with the following requirements:

- a. The floor of the vehicle used to transport safe UXO is protected by sandbags to prevent the UXO from moving around.
 - b. Safe UXO must be aligned, stored and transported in a manner that prevents impact or collision with other safe UXO.
 - c. Safe UXO inside the vehicle must be aligned in a manner that ensures that the nose fuse does not hit the side, front or rear walls of the vehicle.
 - d. Safe UXO must not be transported inside the cab of the vehicle.
 - e. White phosphorus UXO must be transported separately from other UXO.
- Vehicles carrying damaged vehicles may be pulled, but only to the nearest repair facility. The speed of the pulling vehicle must not exceed 40 km/h.

8. Handling of Explosives

The following requirements must be observed by all company employees when working with explosives, especially when preparing or performing demolition work.

- a. Smoking is prohibited while handling explosives or within 30 meters of explosives.

- b. Explosives must be stored in a place where they can be seen and guarded at all times. The exception to this is after the explosives have been placed on the explosive device, but the hazardous area must be kept safe.
- c. Qualified personnel handling of explosives:
 - (1) Only qualified explosive ordnance disposal technicians in accordance with the requirements specified in Chapter 8 of the National Standards may handle or use explosives in demolition work.
 - (2) Appropriately qualified personnel are permitted to handle explosives for administrative purposes only and must be under the supervision of personnel trained in the handling and storage of explosives or personnel trained in the handling and transportation of explosives.
 - (3) Unqualified personnel who are required to handle explosives shall be briefed on the proper handling of explosives and the safety precautions to be observed when handling explosives.
- d. Handling of explosives shall be in accordance with the manufacturer's instructions and specifications.
- e. Clothing worn by personnel handling explosives shall not be of a type likely to cause ignition, such as synthetic fabrics, and shall not be fitted with steel toed shoes or the shoes heel knocked by steel.

9. Management and Control of Explosives

9.1 Explosive Supply System

The explosives used by the Company will be ordered from the military according to the procedures specified by the military and will be deposited in the provincial military depot or district where the Company operates. The Company will withdraw explosives from the military depot in the amount necessary for the Company's tasks based on the appropriateness of the usage rate and is responsible for keeping an account of the use of explosives together with the explosive storage management officer.

The regulations for the management and control of explosives of Silavan UXO Survey Clearance and Ordnance Disposal Co., Ltd. (abbreviated as SLV) are as follows:

9.2 Quality Inspection of Explosives

Before receiving explosives from the military supply department, the company will inspect the quality and condition of the explosives before using them for operations. The company will report in writing to the NRA about explosives that are found to be in poor condition and unusable, stating the type and quantity of the unusable and ineffective explosives. If known, the production code and date of production will also be provided.

9.3 Number of explosives that can be stored in the warehouse

The explosives stored in the company's warehouse shall not exceed the explosive storage capacity for that warehouse.

9.4 Inspection of explosives

The company's responsible personnel shall inspect its explosives once a month. If it is found that the explosives in the warehouse do not match the inventory, they shall report according to the procedures as specified in Section 12 below: Explosives Disbursement and Use Tracking List Account. The company will keep an explosives disbursement and use tracking list account in case the NRA or relevant parties require inspection.

9.5 Explosives Inventory

In the disbursement and use of explosives in the company's operations, a detailed record of the explosives used and the amount currently in stock shall be kept. All explosives used shall be signed and certified by the demolition teamleader, listing and unit of explosives used. The remaining explosives shall be checked against the final figures at the end of each month and the actual explosives in stock shall be checked to ensure that they are in accordance with the figures in the accounts. If the final figures do not match or the explosives in stock do not match the accounts, an investigation shall be conducted to determine the cause of the discrepancy. Records of all explosives shall be kept and made available for inspection.

10. Loss of explosives

As soon as a company suspects that its explosives have been lost, it shall immediately begin checking all explosives in its warehouse against the inventory. If the inspection confirms that they have been lost, it shall promptly report the nature and cause of the loss to the NRA, by giving full details of the loss. The NRA will then consider the next steps to be taken with respect to the explosives.

11. Theft of explosives

When an incident of stolen explosives occurs, the location of the incident shall be immediately closed and secured, and the location shall not be disturbed. The incident shall be reported in details to the NRA and the police. The stolen item may not be identified at the time until an investigation is initiated. The NRA will consider the next steps to be taken with respect to the incident once the investigation is complete.

12. Report Defects in Explosives

If the Company's operations reveal the defects in the use of explosives, the Company shall notify the NRA in writing of the defects of the explosives supplied.

13. Empty Explosives Ordnances and Mines for Training, Instruction and Simulation

Regulations for the management and control of the empty explosive's ordnance and mines for

training, instruction and simulation are contained in the appendix C to this chapter.

Appendix A
Distance table for explosive storage warehouse

Quantity of explosive in Kilogram Distance in meters		Distance in meters							
		Distance from inhabited building in meters		Traffic volume on main road				Distance from warehouse to inhabited building in meters	
				Less than 3000 vehicles/day		More than 3000 vehicles/day			
More than	Less than	Obstacle	No obstacle	Obstacle	No obstacle	Obstacle	No obstacle	Obstacle	No obstacle
0	2	32	64	14	27	23	46	3	5
2	5	41	82	16	32	29	58	4	7
5	9	50	100	20	41	37	74	5	9
9	14	57	114	23	45	42	84	5	10
14	18	64	127	25	50	47	94	5	11
18	23	68	136	27	54	50	100	6	13
23	34	77	154	32	64	58	115	7	14
34	45	86	173	34	68	63	126	7	15
45	57	91	182	36	73	68	136	8	16
57	68	98	195	39	77	72	144	9	17
68	91	107	213	43	86	79	159	10	19
91	114	116	232	48	95	86	172	10	21
114	136	123	245	50	100	91	183	11	22
136	182	134	268	54	109	100	201	12	25
182	227	145	291	59	118	108	216	13	26
227	272	109	318	61	123	115	230	14	28
272	318	161	322	66	132	103	235	15	29
318	363	170	341	68	136	126	252	15	30
363	409	177	354	70	141	131	262	16	32
409	454	182	363	73	145	136	272	16	33
454	545	193	386	75	150	144	289	18	35
545	636	204	409	77	154	153	305	19	37
636	726	213	427	79	159	159	319	20	39
726	817	222	445	82	163	166	332	20	40
817	908	229	459	84	168	172	343	20	41
908	1135	247	495	86	173	185	370	22	44
1135	1362	263	527	89	177	196	392	24	47

Quantity of explosive in Kilogram Distance in meters		Distance in meters							
		Distance from inhabited building in meters		Traffic volume on main road				Distance from warehouse to inhabited building in meters	
				Less than 3000 vehicles/day		More than 3000 vehicles/day			
More than	Less than	Obstacle	No obstacle	Obstacle	No obstacle	Obstacle	No obstacle	Obstacle	No obstacle
1362	1816	288	577	95	191	215	430	26	53
1816	2270	311	622	102	204	233	466	28	55
2270	2724	331	663	107	213	248	496	30	59

Appendix B

Fire protection requirements for permanent explosive's storage facilities

Regulations.

Smoking is prohibited within 30 meters of an explosive's storage facility. Signs stating "No Smoking Within 30 Meters" and "No Open Flames" in Lao and English shall be permanently displayed at the explosive's storage facility.

Grass or brush shall be cut and kept short within 20 meters of the perimeter of the permanent explosive's storage facility.

No tools or equipment that can cause sparks shall be used within 30 meters of the explosive's storage facility. If such tools are required to repair the permanent explosive's storage facility, all explosives in the facility shall be removed.

No flammable liquids, fuels or other flammable materials shall be stored in the explosive's storage facility. Approved cleaning equipment may be used to clean the permanent explosive's storage facility, but shall be removed from the facility when not in use.

No gas containers or empty cans of any kind shall be stored with explosives.

A 2 kg fire extinguisher shall be kept outside each permanent explosive's storage facility and shall be readily accessible. If there is a risk of a new grass fire in the area surrounding the permanent explosive's storage facility, additional fire extinguishing equipment such as shovels, sand buckets and wooden block shall be provided.

All fire extinguishing equipment shall be maintained in a serviceable condition at all times.

Lightning rods or earth wire must be installed in explosive's storage facilities to protect against lightning.

Signs indicating items prohibited from being brought into explosive's storage facilities must be clearly displayed at the entrance to the facility. Items prohibited from being brought into the facility include:

- a. Lamps, oil lamps, stoves and heaters or any other equipment that can produce flames.
- b. Matches, lighters or other items that can produce fire or flames.
- c. Tobacco of any kind and anything used for smoking purposes.
- d. Flammable liquids and flammable cleaning fluids, other than those permitted for use during maintenance, are strictly prohibited from being brought into the facility.
- e. Food and beverages.
- f. All types of communication equipment, including mobile phones.

g. Medicines and other substances than those permitted for first aid kits are prohibited from being brought into the facility.

j. Any device that is a source of energy that can cause a flame.

A sign with contact details for access to the explosive's storage facility should be posted outside the permanent explosive's storage facility.

Appendix C

Empty Explosives Ordnances and Landmines for Training and Simulation

General Guidance

The purpose of this Appendix C is to ensure that empty UXO and mines for training and simulation is properly stored and recorded for the following purposes:

- a. To prevent accidents
- b. To prevent incidents that may lead to misunderstandings in verification that could lead to unnecessary clearance or securing of UXO.
- c. Ensure that UXO and empty mines for training, education and simulation are safely stored.

Dismantling or modification of empty UXO and mines for training, education and simulation shall be prohibited. It shall be carried out by personnel with appropriate knowledge and skills and be a Level 4 explosive ordnance disposal technician qualified in the disposal of such ordnance as specified in Chapter 8 of the National Standard on [“Explosive Ordnance Disposal”](#).

Storage

Empty UXO and empty mines for training, instruction and simulation are prohibited from being stored in live bomb containers. They shall be stored separately in the same manner as empty or training bombs, marked in both Lao and English. All other markings on the containers shall be removed to ensure that they are not confused with the containers used to contain live bombs.

Movement

Empty UXO and empty mines for training, instruction and simulation should not be moved with vehicles carrying live bombs.

Empty UXO and empty mines for training, instruction and simulation should not be moved with live bombs. They should be moved separately and clearly marked as “Empty UXO” or “Practice UXOs” in Lao and English. Other markings should be removed from the containers to ensure that there is no confusion with live bombs.

Dismantling of Mine and munitions.

No organization or company shall dismantle, modify, or perform any other procedure on mines and munitions unless it has undergone a course on inspection, modification, or demolition in accordance with appropriate technical standards.

Marking of Explosive Ordnance and Mines Used for Training

Empty UXO and Mines used for training, instruction and simulation shall be clearly marked in Lao or English on the side of the munitions as an ‘[empty ordnance](#)’ or “[ordnance for training](#)”. This is to ensure that they are clearly visible from all angles and to prevent unexploded ordnance clearance operations.

All empty ordnance used for training, instruction and simulation produced by the demining organization shall be assigned a unique identification number for each item. This identification number shall include the initials of the demining organization or company that produced the item.

Empty bomb certificates

UXO and mines for training, teaching and simulations conducted by the demining organization must be certified as empty (without explosives) by a qualified demining technician who has the knowledge and experience to produce the bomb. The certification must include the following information:

- a. Unit code number
- b. Name of demining technician who produced the empty bomb
- c. Brief description of the empty bomb
- d. The empty bomb certification must be written as follows:

I hereby certify that the bomb described in this empty bomb certificate do not contain explosives, incendiary bombs, tear gas, radioactive materials, chemical agents, weapons of mass destruction or toxic substances. I hereby certify that the bomb is marked as a "practice bomb" or "empty bomb". I hereby certify that this bomb is safe for use for training, demonstration or teaching purposes.

Name and signature of the demining technician

Registration and inventory of empty UXO or other empty mines for practice, teaching and simulation under their responsibility shall be accompanied by a blank bomb certificate.

The demining organization shall implement appropriate accounting procedures to ensure that the empty UXO or Mines for practice, instruction and simulation in its possession are accurately accounted for and traceable. All transfers of empty UXO or Mines for practice, instruction and simulation from the custody of any individual or organization shall be clearly recorded so that responsibility for the munitions can be clearly identified at all times.

Display of mines and munitions

Only Mines or munitions that have been manufactured or produced and are certified to be free of explosives in accordance with this appendix are permitted to be displayed in public places. Mines, UXO and munitions mixed with real ones are not permitted to be displayed in public places. Except in the case of visitors to the site, that may be shown real mines and UXO, but the munitions must be made safe first. In this case, the display must be under the supervision of a explosive ordnance disposal expert or a site clearance task supervisor.

Mines, UXO and munitions displayed in public places must be strictly secured by being placed in glass cabinets, cabinets attached to walls or by any other means to ensure safety and prevent unauthorized movement or removal.