

CHAPTER 13

SALVAGE & OVERHAUL

Definitions and Objectives

Salvage is the protection of buildings and their contents from unnecessary damage due to water, smoke, heat, and other elements. A significant amount of fire loss is created during extinguishment operations and other events after the fire has been controlled. Although we can do little to prevent direct loss caused by fire and its by-products, aggressive and efficient salvage operations, performed as early as time and personnel permit, can greatly reduce the total loss and prolonged damage to a building and provide customer service.



By the nature of our job, some suppression tasks will result in damage to a structure (ventilation, forcible entry, the use of hose streams, etc). It is the fire departments responsibility from forcible entry at the beginning of the call, to the final stages of overhaul, with providing customer service in regards to controlling damage in order to keep the occupants losses to a minimum.

The success or failure of salvage operations can be directly attributed to the degree in which firefighters have trained with salvage equipment and techniques. It is a combination of this familiarity mixed with thinking and ingenuity that will enable effective and timely salvage operation on the fireground.

It is important to remember that salvage remains an essential function to the fire service to promote customer service. Victims of the fire will recognize the fire departments efforts when irreplaceable personal belongings and other contents are saved through salvage work. Successful salvage can be accomplished by a small number of well trained and well prepared fire personnel. EFFECTIVE SALVAGE = GOOD PUBLIC RELATIONS.

STRATEGIC PRIORITIES

Strategic priorities relating to salvage operations will be dictated by the type of incident (fire, flood, etc). Factors that must be considered may include, but are not limited to:

- Type of structure
- Size of structure
- Occupancy
 - Residential – start with the irreplaceable belongings such as photographs, jewelry, medications, and other sentimental items. Next move on to clothing and essentials, followed by furniture bedding, etc.
 - Commercial – Give priority to any bookkeeping materials and other records that include computers and filing cabinets, then move on to merchandise.
 - Industrial – As with commercial, consider records first. Then pay attention to any valuable machinery and raw materials.
- Progression of the incident at the time of arrival.
- Value of contents.
- Fire sprinklers and other automatic suppression systems.
- Possible locations of records and files (including computers).
- Personnel available
- Salvage equipment available.

An effective salvage operation begins with a good scene size-up as part of a coordinated attack. Size-up of an incident must be made to gather information on what needs to be done and how it will be accomplished. Salvage size-up can begin as early as pre-planning buildings to identify areas that may be a salvage priority. This size-up needs to be considered upon dispatch and included in all phases of the fireground operation. Salvage size-up includes the following steps:

- Facts – nature of the incident, type of occupancy and type of building construction.
- Probabilities – estimation of progress, possible hazards, weather, etc.
- Available Resources – type and quantity of necessary of resources and personnel to perform effectively.
- Decisions – what are the objectives that need to be accomplished?
- Plan of Operation – How will the objective be accomplished?

TACTICAL CONSIDERATIONS

Controlling damage at the scene of the incident is the goal of effective salvage. To achieve this goal, crew members should train and become proficient in all operations relating to the following:

- **Forcible Entry** – Know how to gain access with the least amount of damage as possible. Ensure that the amount of damage is warranted by the urgency of the situation. If there is no sign of immediate life hazard and no significant signs of fire, consider a less destructive means of gaining entry.
- **Ventilation** – Ventilation will assist in lessening damage due to its ability to confine the fire and other damaging products to a confined area. The rapid removal of heat and other products of combustion can significantly lower the amount of direct fire loss. Horizontal/positive pressure ventilation is another way to limit damage to a structure. Ordinary doors that are closed may block a significant amount of heat and smoke from extending to other areas of the structure. If no door exists, rolled plastic or salvage covers work well as a temporary draft curtain.
- **Application of Water** – Although managing hose streams is not a common function of ladder work, applying water at the wrong time, from the wrong place, with the wrong nozzle pattern causes significant amount of preventable damage. Every attempt should be made to locate the seat of the fire, and only apply as much water that is necessary to control the situation. Pressurized water cans may be considered to control a small fire before hose lines are put in place.
- **Dewatering** – methods used to remove water from a structure are only limited by the amount of salvage equipment on hand and the ingenuity of the crew. Do not waste time saving goods that have already been damaged when better time can be spent directing the flow of water or removing goods and material from the path of water. In multiple story buildings, salvage may need to be initiated on lower floors prior to starting on the fire involved floor.
- **Overhaul** – Effective overhaul will also limit the loss to the occupant and structure. An overhaul crew can sometime recover valuables that otherwise may have been written off as a loss. Businesses have been able to reopen quicker when firefighting crews have recovered files and important papers before they were destroyed.
- **Covering of Goods and Materials** – In order to be effective, this operation must begin as early in the incident as possible. Before covering begins, consider these facts:
 - Can the valuables be moved to a safe place eliminating the need for covering?
 - Is there enough plastic or salvage covers to effectively cover all the valuables?
 - Are the valuable you intend to salvage already lost to fire, smoke, or water?

Although traditional salvage covers prove to be valuable, plastic covers should be a strong consideration in the following situations:

- Used as an additional vapor barrier under a salvage cover.
- In areas where a large square footage of goods needs to be covered.
- Valuable will be covered for an extensive period of time
- If covered materials will need to remain covered even after the incident is over.
- For covering valuable in floors below the incident.

Plastic covers are also an advantage because large quantities can be stored easily on the apparatus; it can be left on the scene, and is more cost effective than traditional salvage covers. Plastic can also be attached by using only a staple gun. This makes plastic an effective tool to cover doorways or cover the floor of a room prior to ceiling being pulled.

Common Salvage Tools:

- Salvage covers
- Hall runners
- Salvage bags
- Plastic sheeting
- Water vacuums
- Scoop shovel
- Squeegees and mops
- Fans

Care of Covers

Salvage covers are expensive and like other tools will benefit from the proper use and handling. When used, the covers may be subjected to severe wear and tear, but through correct maintenance and inspection their usable life can be extended. Listed below are guidelines to get the most usable life from the covers.

1. Salvage covers should not be folded amid broken glass or debris.
2. Salvage covers should not be thrown or dropped from roofs or windows.
3. Caution should be exercised when removing salvage covers from machinery or sharp objects.
4. If necessary to hang covers, nails should be placed through grommet holes only. Nails should never be driven through the covers.
5. Covers should be inspected carefully prior to folding to make certain that they are dry, clean and in good repair before being placed back in service.
6. Covers should be inspected and refolded monthly

Washing Covers

Salvage covers should be washed, thoroughly dried, inspected for damage and folded after use. They are placed one on top of the other with the finish side up when washing. Tar and heavy grease should be removed gently with a scraper and a small amount of paint thinner or cleaning solvent. A mild soap solution may be used when the dirt cannot be removed with plain water and a broom. The cover is thoroughly rinsed and folded one half widths, one quarter width, then one half-lengthwise and one quarter lengthwise. The newly exposed side of the cover is washed and rinsed each time it is folded. After washing, the covers are hung up and dried completely prior to refolding.

Hall Runners

Hall or floor runners are made from damaged salvage covers. They are cut lengthwise, eliminating the damaged sections and are 3' wide by 18' long. Their principle use is to provide protection for carpeting and tile floors during and after an emergency. They should be deployed as soon as possible to reduce damage caused by foot traffic and overhaul operations.



PROBLEMS OF COVER WORK AT FIRES

It is seldom possible to cover everything of value, so judgment must be used as to what is most valuable and where the damage is likely to be most severe. Operations should begin where the greatest loss is expected. Property owners are usually eager to point out what objects they would want saved or protected first. It is most important to make every effort to protect electronic equipment such as copiers, computers and printers. Files and paper work are very important to most businesses. When possible, remove file cabinets and boxes of files if the owner is there to secure or take possession of them.

Smaller items from closets and cupboards can be placed on beds or other larger objects to be covered. If possible move items of the room into one close pile that may be covered by a single salvage cover. Care must be used when covering glass showcases. Materials on top of cases should be put inside if possible or laid flat on top of the counter.

Many items will pick up water if left on the floor. Pallets or other means can be used to get materials off the floor in warehouses or commercial businesses. Blocks of wood or any other items that will get valuable items out of standing water helps with property conservation and promotes customer service.



FOLDING COVERS

ACCORDION FOLD

In this fold, salvage covers are folded as an accordion and held together at the ends. The accordion fold permits ease in handling and storage and is able to be deployed in numerous ways using either one or two firefighters.

Place the cover on a clean surface with the finished side up.



Fold the corners in approximately 12 inches.



Bring the outside edge to the middle of the cover from both sides.



Fold the cover in half again over the folds that were just completed (quarter



Fold the quartered cover in half.



The accordion fold is started by two firefighters facing each other at the same end of the quarter folded cover start the accordion fold. The palm of the hand nearest the end of the cover is placed flat on the cover, 10" from the end. The other hand is placed palm up under the edge of the cover about 10" ahead of the first hand. The cover is then brought back over the first hand until the fold is even with the end of the cover to form the first fold. The operation is continued until the cover is completely folded



SALVAGE COVER THROWS

There are four salvage cover throws that may be utilized depending on the need:

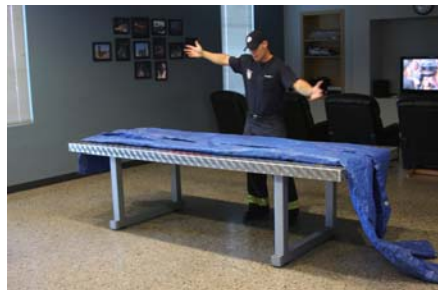
1. One firefighter throw
2. Two firefighter counter throw
3. Two firefighter balloon throw
4. Two firefighter modified balloon throw

One Firefighter Throw

The one member throw is used to cover rolling stock, counters, piles of merchandise and furniture where there is no danger of damage from the cover as it is thrown over the object to be covered. The throw can be made with either arm. The procedure outlined is for the right arm throw.

The center of the folded cover is placed over the left forearm with the closed end or center of the cover toward the left side. The bottom fold is held with the left hand while the cover is thrown. Reach away from the body with the right hand, and grasp the three top folds. Keep the right arm straight and bring the three folds back over the right shoulder allowing the folds to fall back on the out-stretched fingers of the right hand. Stand to the right of the center of the object to be covered and throw the cover, keeping the right arm straight during the process.

The cover should fall in place with its center near the center of the object being covered. It is then unfolded and the surplus cover tucked in around the bottom.



Two Firefighter Counter Throw

The counter-pay-off is a two-person operation used where conditions require the careful placing of a cover to avoid unnecessary damage. This is done particularly on tables or counters displaying fragile merchandise.

The cover is held on the forearms with the center or closed end toward the counter, both hands grasping the bottom fold. Raising of the forearms serves as a brake as the folds pay out. The second person grasps the top fold with both hands and walks backward until the cover is fully extended. The center of the cover is gently lowered over the center of the counter unfolded and tucked in at the bottom.



Two Firefighter Balloon Throw

The two-member balloon is generally used to cover merchandise or objects by opening the cover in such a manner that air will assist in floating it over the object to be covered. The height to which a cover can be raised in this manner will depend upon the space above the object being covered and the amount of air brought under the cover during the ballooning process. The cover is held on the forearms with the center or closed end toward the object to be covered and straightened out as in the counter-pay-off evolution. Grasp a corner in between the thumb and forefinger of each hand. With the remaining three fingers, grasp the edge of the cover at approximately the three-foot mark.

With the feet well braced, both members lean forward and upon signal, snap the cover up quickly so air can get underneath, forming a balloon. As the air underneath raises the cover to the desired height, each member will release the outside hand and float the cover over the object being covered with the inside hand. The surplus cover is tucked in at the bottom as in the counter-pay-off evolution.



Modified Two Firefighter Balloon Throw

The two-member balloon evolution may be modified when there is sufficient space and the floor or ground is dry. The counter-pay-off is made, the cover unfolded and placed near the object to be covered.

Each person grasps the outside edge of the cover at the corner and as they move forward, the cover is brought up and floated over the object being covered. Once again the cover is tucked in around the bottom.



Sealing Edges

When more than one cover is used it may be necessary to seal the edges where they overlap. The edge of the cover already spread is turned back about one foot. The edge of the adjoining cover is placed over the one-foot lap with the edges of both covers even. Grasp both edges and roll until the one-foot lap is completely rolled out.

Removing Covers

When removing salvage covers after a fire, caution should be taken to prevent unnecessary damage to the contents of the building and merchandise stored on counters. Water and debris on top of covers should be retained and removed with the covers. This is best achieved by working as a team. By folding the cover back on itself, in half and then quarters, the debris can be retained within the folds. Grasp the corners and walk forward folding the cover in half. Both ends are then carried back to the center, folding the cover in quarters. One more fold will be made in the same manner.

The cover can be carried by one or two firefighters to the outside where the debris can be disposed of properly.

Hanging Covers

Hanging covers used to protect merchandise stored on shelves or racks is accomplished by securing the covers in place with "S" hooks or nails through the grommets. The covers should be overlapped at least one foot

Stairway Drain

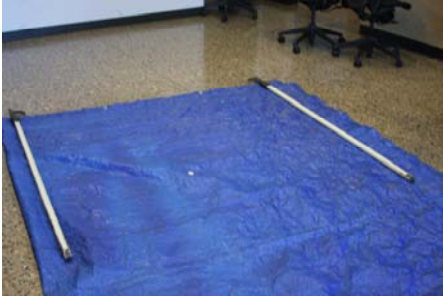
When diverting water down stairways, use a salvage cover to form a chute in the stairway. The stairway drain can be used to divert water from a building or floor. The length of the stairway will determine the number of covers necessary. The one-member throw or the counter-pay-off can be used to spread the covers.



The cover is secured in place over the handrails or with "S" hooks. The edges may also be rolled to form a chute down the stairwell. The bottom of the cover is laid and secured in place first, and a one-foot overlap is made as the additional covers are positioned up the stairwell.

Window Drain

Water may be diverted from a window using a drain formed with a cover and two pike poles or with a ladder for supports. When pike poles are used the cover is laid out flat, the pike poles placed along the sides or ends and rolled toward the center until the desired width is reached. The handle end of the drain is placed out of the window and the end with the pike pole hooks, is placed over the ladder rungs, furniture or other supports.



Catchall

A final means of making a catch basin is to use an A-Frame ladder and roof ladders. The ladders are laid out to form a triangle, a trash hook placed over the ends, and the salvage cover is placed over the top of the ladders with the center allowed to bag down. This may also be accomplished with three straight or roof ladders.



OVERHAUL

Overhaul is the practice of searching a fire scene to detect hidden fires or smoldering areas that may rekindle and to also safeguard signs of arson. Overhaul should begin after the main fire has been knocked down. If the fire is of suspicious origin, only minimal overhaul should be performed until a Fire Investigator has cleared the area. When checking for fire extension, careful inspection of wall and ceiling openings should be made. Care must be exercised not to overlook possible avenues of extension; hidden fire in void spaces is a frequent cause of rekindle. Every effort must be made to be certain the fire is totally extinguished to prevent rekindles.

Overhaul operations should always follow a set plan or pattern. It is best to start nearest the area of origin and work out from that point. Personnel should be in full PPE during initial overhaul operations and a charged hose line should be in place. A booster line does a good job putting out small fires and cooling hot spots with a minimal amount of water in small one room fires or fires in single family dwellings. Larger lines may be needed in commercial buildings. This limits some of the water damage to the building and contents.

Searching for Hidden Fires

The objective in searching for hidden fires should be to make a careful check to determine whether the fire extended to other areas of the structure or is still smoldering in a hidden space. Before starting a search for hidden fires, it is important to evaluate the condition of the area to be searched. The intensity of the fire and the amount of water used for control are two important factors that affect the condition of the building. The extent to which structural members have been weakened and the additional weight of the water used to control the fire should be considered for the protection of personnel during overhaul operations. In one-room content fires take a good look at the ceilings and walls. If they are still intact you may want to look in the attic access before taking down the ceilings. If there is any doubt, begin where a void exists. This may be vent piping in heater rooms or light fixtures in living quarters. Wall openings such as switch boxes and light fixtures can also be a path for fire spread. These areas can be opened first to inspect for evidence of fire extension or smoldering. Only enough wall, ceiling, or flooring should be removed to assure there is no extension. Often time's unnecessary damage is done during overhaul.



Pulling Ceilings

Pulling down ceilings is tiring work. It is often better to work in shifts than to have too many people trying to pull down the ceiling in one room. Insulation material may harbor hidden fires or smolder for a prolonged period of time. It is important to check this material thoroughly. Head and eye protection should always be worn. When pulling down the ceiling material do not stand directly under the area you are working on. Have the tool extended in front of you and pull down so that the material comes down in front of you. You should work from the farthest point in the room towards the door or exit to keep your exit route from being blocked by falling debris.



Windows and Doors

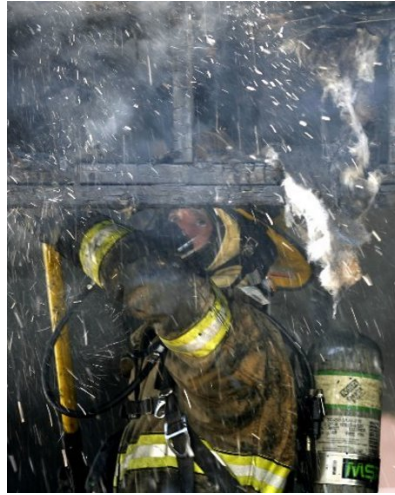
When fire has burned around windows or doors, there is a great probability that there is fire or smoldering remaining within the frames or casings. These areas must be opened to ensure complete extinguishment. By simply pulling off the molding to expose these areas you can see if there are any hot spots. This should be done on both the interior and exterior.

Walls

Opening walls should include removing paneling, chair rails and other decorative molding around the wall. Using the axe, begin horizontally until a structural member is found. Begin a vertical cut with short downward strokes along the stud. This shearing motion along the stud will cut through both drywall and lath and plaster. A reciprocating saw can make a very clean cut if a section of wall needs to be removed for investigation. This will usually leave a symmetrical opening that is easily repaired.

Roofs

Overhauling a roof can be a very long and tedious process. Often there are multiple roofs under the most visible one and each one needs to be removed and checked for possible fire extension. The removal of all the material exposed to the fire that could smolder for a long period of time is not only difficult but also includes the inherent dangers of working above ground.



The material must be removed from the roof and cooled on the ground, which creates a danger to those firefighters on the ground from falling debris.

Personal protective equipment should be worn during the early stages of overhaul operations. Smoldering material will give off more of the by products of combustion than when the fire was free burning. Carbon monoxide has cumulative effects on the body and SCBA's should be worn until the area is well-ventilated and smoldering contents extinguished. The possibility of hot materials, sharp objects and falling debris is also present. Full head and eye protection is mandatory for pulling ceilings and opening walls. Company Officers should make sure all their personnel are in the proper protective clothing for the situation.

Removal of debris as the search for hidden fires is completed helps keep the work area clear. Materials from walls and ceilings should be removed to the outside and any smoldering material extinguished. The material should be placed in a pile outside in one area to assist the owner and clean up crews. Customer service should always be a consideration during overhaul and salvage work.