

First Texas Volunteer Restoration Program
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December 2006

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Part 1

History of Projects

Over the years the volunteers have been involved in many different restoration projects aboard ship. We are just going to cover a couple of them here as an example.

Before I start let me explain that each project is discussed at length and a "Work Order" will be written explaining what is to be restored and the procedure to do it by. The work order will be discussed later in detail. The volunteers do NOT do as they wish they are to ONLY work on the projects that are approved by TPWD.

1st. Sgt's Office

- Located on the second deck (starboard) in the Marines space. This was the office for the senior enlisted Marine aboard ship that was in charge of the unit.
- Below are some before and after photos.



Before/After



General Store Keepers Office

- Located on the second deck (Port side) near the Post Office.
- The reason this compartment was chosen over others we were looking for a compartment that could be restored to it's 1945 condition with enough space that the BTARS ham radio club (without damaging or altering the compartment) could use it a couple of times a year for events aboard ship. They have come out during Yuletide, Historic ships' Ham Fest (summer normally July) and others.
- The project was started in January 2002 and completed June 29, 2002.
- 679.75 volunteer hours were spent on this project. If the State had contracted this out at \$65 hour it would have cost just over \$44,000.00



McArdle Project

- It is difficult to sum up a project that took two years and 10 months 3428.25 volunteer hours to complete in a short paragraph. This project encompassed the front 60' of the ship on the second deck forward of the Ward Room.
- Again the scope of the project was laid out in the Work Order. On this project because there were three compartments we had three work orders. The passageway, Officer's stateroom, Officer's Head.
- This project was selected because.....
- The McArdle family has been involved with the ship over the many years with different events. It was hoped by the family that at some point their father's stateroom could be restored. When the volunteers completed the General Store Keepers office we were looking for another project. Mr. Barry Ward (ship's manager at the time) suggested this project along with a couple of others.
- Project was started February 2003 and completed in November 2005.





- These two photos are showing the different tools we use such as welders, grinders and the safety equipment (Positive Air Suits). We will discuss tooling at length later.



The tile deck in the Officer's Head was a challenge. They don't make that size anymore so a couple of volunteers had to "Hand Cut" 1300 tiles to complete the damaged areas.

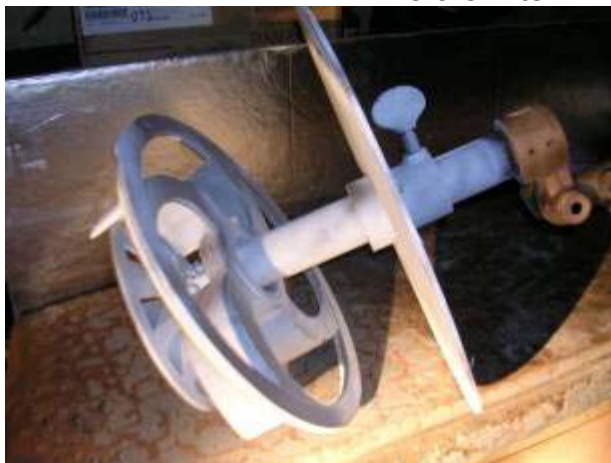


3 Boiler Room

- This project was selected because we wanted to have one area in the Hard Hat Tour where we could show the public a “Before” and “After” on restoration efforts.
- It was decided that the Starboard side of the # 3 Boiler Room would be restored and the Port side left “As-Is”.
- This project was started in Oct 2003 and is still presently going. The project is divided into three phases. Phase 1 is the restoration procedure for the front of the starboard boiler. Phase 2 is the bulkheads in the boiler room and up the passageway starboard side to the third deck. Phase 3 is the restoration of the piping and the various pumps.



Before/After



During.....

Part 2

RESTORATION HANDBOOK

A HANDY GUIDE TO GOALS, TECHNIQUES
MATERIALS AND SAFETY

By: Donald H. Fischer
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General

Restoration is one of several important functions performed by the First Texas Volunteers (FTV). Restoration allows Texas Parks & Wildlife Department (TPWD) to stop deterioration within the ship, establish a new barrier to fight future deterioration, and open compartments or spaces for viewing by the general public and special groups. This is critical inasmuch as the Battleship TEXAS is, as are many of its systems and equipment, the last of its kind.

Restoration is not applying paint touch-ups, or making miscellaneous repairs to existing compartments, systems, equipment or weapons. These more correctly fall under Preventive Maintenance (PM) or Repairs and Maintenance (R&M). Restoration assumes an intent to re-construct or rehabilitate a compartment or space to the ship's target restoration of Spring, 1945. Doing so requires following strict guidelines in the scope of work, preservation techniques and attention to detail in application of finishes.

Restoration includes an entire spectrum of activities, from removing rust and old lead based paint, prepping and painting to the correct color with modern approved paint, to uncovering brass plaques and fittings of various forms and functions and preserving its natural finish, fabricating new parts, such as bunk stanchions and hooks, ventilation ducts, rifle racks, etc., to preserving and restoring to function such equipment as original electrical switches, panels, fixtures and speakers. Some of these activities take great skill by individuals who work within these trades, but there is much that can be done by non-tradesmen. In fact, virtually everything we do except electrical, plumbing, welding or steel cutting activities can be done by any of our volunteers. It is in these areas that this short guide concentrates.

Since Battleship TEXAS is a valuable and important historical and engineering artifact, there are a number of "do's and don'ts" associated with restoration work. These are covered within and form the backbone for our activities. Together with specific instructions and guidance for each compartment Work Order, volunteers can readily identify work to be done, the degree of completeness to be accomplished, areas or items to be avoided, and finishes to be applied.

Finally, this handbook is not intended to be the answer to everything involved in restoration. It is simply a guide that can be used in almost all instances when other more specific guidance is unavailable. Also, the safety tips are just that. Read instructions on all products and follow their instructions, or follow safety requirements stipulated by OSHA and other responsible agencies. Whenever in doubt, ask.

Work Orders

Every restoration project will be preceded by completion of an approved work order. Until this work order is approved and funds identified, restoration will not take place. In the past, this has meant that until funds were appropriated for both the structural components of a compartment and the fixtures, furnishings and equipment (F, F&E), no restoration work was to be commenced. Currently, practice tends to be that work may be authorized on a project by project basis, to restore the compartment or space, even if F, F&E funding has not been met. These items may be funded and installed at a later date.

Individuals working on restoration projects should frequently review the work order to ensure the scope of work is being adhered to and damage will not be done to critical finishes or equipment.

For identification purposes, the cover page and introduction to a typical restoration work order accompanies this guide.

See example on the next page:

Do's and Don'ts

Specified equipment, soft metals and finishes must be protected and preserved while restoration is underway. As a general rule, adhere to the following "do's and don'ts". Exceptions, if any, will be approved on an item by item, event by event basis.

Do protect items that might be damaged by stripping, cleaning, washing, scraping, etc., such as insulated pipes, electrical outlets, junction boxes, plastic and brass tags, etc.

Do identify soft metals, i.e., brass, prior to applying mechanical or abrasive tools to them by use of magnets, etc.

Do be careful in using scrapers, pads, wire brushes, metal wool, or any type of abrasive. Use the least harsh method that will do the job.

Do use only a tool that is softer than the surface being restored. Use 3M Scotchbrite pads – carefully – on brass or aluminum.

Do be careful using paint stripper. Allow the stripper to soften the upper paint layers, then GENTLY lift the softened paint with a putty knife, 3M pads or rags.

Special Note: If stripper is used on plastic, verify with curatorial staff before applying to specific pieces; they have experience with reactions of chemicals on various materials.

Do safeguard parts/fasteners that must be removed, i.e., screws, nuts, etc. Place in plastic bags identified with notes in indelible ink showing their original locations. Place in secure location.

Do mask any exposed electrical outlets, light sockets, j-boxes and surfaces to be left unpainted.

Do stamp all new steel with date of installation.

Do not needlegun or power sand/brush the following:

Hull and pipe insulation	Brass
Aluminum	Plastic
Wood	Porcelain enamel
Chrome	Stainless steel
Linoleum	Items shown on drawings
Any surface seen to be damaged by work	

Do not disturb insulation on pipes, etc. Most contain asbestos. Report any tears in insulation wrap to ship's manager.

Do not paint over any brass tags or plates, unless specified by work order or by authorization of TPWD staff.

Do not paint over any plastic tags or fittings, nor any manufacturer's tags on equipment, i.e., RCA tags on speakers, etc.

Safety

Safety is paramount in everything we do. All volunteers provide their time and skills at their own risk. The guidelines stated below should provide a good overview of areas of concern and precautions to be taken, but they are only guidelines. Individuals engaged in restoration work should always follow safety guidelines provided by suppliers of equipment, materials and supplies.

Much of the restoration activity by necessity occurs in areas that are risks to injury or health. Old paint to be removed is normally lead based, a serious health hazard; rust and dirt can cause infection to wounds, and mishandling of tools can cause serious injury. All wiring except lighting is to be deactivated by the ship's staff for the duration of the project; however, never assume. Be careful!

To enhance your safety, always:

Let a staff member or other volunteer know where you are working. Be sure to let them know when you have completed your work.

Periodically, check in with the staff so that they are assured of your well being.

When working in a dusty environment, regardless of source, always wear an approved filter mask.

When removing old lead based paint by mechanical means, you must abide by the SOP for lead based paint removal (see PART 3).

Do not disturb duct or pipe insulation. It could contain asbestos. If damage occurs or is noted, report it to the ship's architect or manager immediately.

Wear safety goggles. Wear the flexible type that makes a seal around your face.

Wear good work gloves.

When using power or pneumatic equipment, wear ear plugs or "Mickey Mouse" ears.

Various chemicals used in restoration, for example strippers, may be toxic. Take precautions, i.e., rubber gloves, adequate air flow, respirator, etc. and follow recommendations of the manufacturer.

In summer, take plenty of breaks and drink plenty of water. It becomes extremely hot in the compartments undergoing restoration. Do not take a chance of becoming a heat casualty!

Always follow safety guidelines for the equipment you are using.

Always keep a flashlight on your person, especially when working below in confined spaces.

Follow the directions of responsible TPWD personnel.

Equipment

Hand, power and pneumatic tools are used in restoration work. Only authorized personnel, however will provide assistance in electrical, plumbing, welding or cutting torch work. These personnel will be either TPWD, contracted or licensed FTV members.

This short section is not intended to provide instruction on the use of these tools and pieces of equipment, but simply to provide a reference to the commonly used equipment and uses.

Tools and equipment are located in the FTV storage room (Executive Officer's cabin & stateroom), D-109 on the Third Deck and the Shipfitters Shop on the Main Deck. If you cannot find what you need, ask one of the regular staff for assistance.

Commonly used equipment includes the following:

Tape/Putty Knives	To assist in removing paint from surfaces after applying a stripper; to remove caked on deposits from tight areas, miscellaneous uses.
Wire Brush	To remove loose rust and paint from steel surfaces.
Scraper (Hand or Pole)	To remove loose rust or caked on deposits from open and relatively smooth surfaces, i.e., decks, bulkheads, etc.
Magnet	To test metal to verify ferrous from non-ferrous materials. Non-ferrous materials, i.e., brass especially, cannot have power or pneumatic tools used on them. The soft surfaces will be damaged. Paint to be removed from these surfaces will have to be accomplished with chemical stripper.
Needle Scaler (Needle Gun)	Pneumatic tool used to remove paint and rust from steel surfaces. It works very well in removing finishes from curved, angled and recessed surfaces.
Piston Scaler	Pneumatic tool used to remove paint and rust from steel surfaces. This tool can reach surfaces unreachable to needle scaler since the orientation of the pistons is 90° off the long axis of the needle scaler.
High Speed Sander	Pneumatic tool, which uses a wide variety of wire brush or abrasive pad attachments to remove paint and rust. Works very well to do finish work on steel surfaces following needle gun work.

Floor Maintainer (Sander)	An electrical appliance, that through the use of different pads, can polish hard surface floors/decks or remove finishes through the use of abrasive pads.
Air Compressor	Provides air pressure to operate pneumatic tools. The primary compressor is the large piece of equipment on the landing by the ticket booth and painted Navy Blue like the ship (therefore called "Blue Beast"). This compressor has the capability of running at least 4 pneumatic tools at a time.
Airline Filter	This filter is an instrument used to eliminate water vapor from airlines supplying pneumatic tools. The major airline from the compressor terminates at the airline filter, where smaller 3/8" lines are then attached. The tools are then attached to the opposite ends of these lines.
Paint Sprayer	Used to spray paint over large areas and to speed up the painting process. This method generally allows even finishes, along with the capability to reach recesses and around awkward angles. Pressure is provided by the air compressor. Be sure to mask all equipment, etc. not to be painted.
Sandblasting Booth	The volunteers have built a sandblasting booth which is currently located in casemate 4 on the second deck. This is a modular design so that it can be moved to other areas of the ship as needed. Have someone check you out BEFORE you try to use it on your own. Most Artifacts can not be sandblasted.

Consumable Materials

Consumables are supplies and materials that are expended during use – for example, paint, masking tape, etc.

Paint. Interior paint used on the ship for painting bulkheads, decks and equipment is . This paint must dry for at least 24 hours prior to applying a 2nd coat or for conducting further work on those surfaces.

Principal colors used within the ship are:

“Deck Red” – 1968 Federal Standard Color (FSC) No. 20109
Use on deck and bulkhead bases as directed.

“White” – 1968 FSC No. 27880
Use on all bulkheads and overheads throughout ship except where otherwise specified.

“Officer’s Green” – 1968 FSC No. 24670
Typically used on all overheads and bulkheads in “Officer’s Country” and certain other compartments as specified, i.e., disbursing office, etc.

“Equipment Grey” – 1968 FSC No. 26307 or is it 22081
Typically used for electrical cabinets, stanchions, etc.

“Warm Light Grey” – 1968 FSC No. 26559
Typically used on desks, drawer units, cabinets and tables below desk height.

“Black” – 1968 FSC No. 27038
Miscellaneous uses, such as oil line striping.

“Striping Yellow” – 1968 FSC No. 13538
Used for vent duct striping.

“Striping Green” – 1968 FSC No. 14062
Used for salt water line striping. Also on some turk’s heads.

Primer

Clear Sealer

“Incralac” – Used on unpainted brass, aluminum and stainless steel that will not be handled often.

“Nu-Finish Car Polish” – Used on unpainted brass, aluminum and stainless steel that receives frequent use, such as door knobs and handrails.

“Shellac” – Use clear, alcohol-base shellac to coat and protect original stenciling, striping, and hand-painted lettering where possible to preserve them. Suggest spray shellac.

Steel Preparation. Once old paint and rust have been removed, steel must be prepped prior to the application of primer and the finish coat of paint.

“Extend” – A polymer-based rust inhibitor. Apply to all unpainted (exposed) steel. Allow to cure for at least 24 hours.

Note: The ship’s staff may purchase several brands of such “inhibitors” or “converters”. Follow the instruction on the labels. One other such product is Interguard Interseal Converter.

Galvanized Steel Preparation.

Vinegar – Wipe galvanized steel with vinegar once paint and rust have been removed. Allow to dry before applying primer.

Brass Preparation

“Never Dull” – This product is preferred since it is less abrasive than products such as “Brasso”. This product is rubbed over the surface until the polish completely covers the surface. Then, using a “soft” cotton cloth, remove the polish.

Degreaser

Devco “Devprep 88” water based cleaner to remove grease and oil and prep surfaces for restoration and/or painting. The product is biodegradable and easy to dispose.

Stripper

Use commercial strippers such as “Bix” to remove layers of paint from appliances and other artifacts that mechanical means cannot be used. Lift off with tape or putty knives, or with Scotchbrite pads.

Part 3

STANDARD OPERATING PROCEDURES SOP CONTROLLING LEAD EXPOSURES for BATTLESHIP TEXAS VOLUNTEERS

ORGANIZATION: Texas Parks & Wildlife Department, Battleship TEXAS State Historic Site

SUBJECT: Controlling Lead Exposures

PURPOSE: To Establish a Uniform Program/Procedure

APPLICABILITY: Battleship TEXAS **Volunteers**

DEFINITIONS: None

PROCEDURES: Housekeeping, Personal Hygiene Practices

The following measures will effectively reduce the volunteers period of exposure to and the ingestion of lead, significantly reduce the movement of lead between work spaces and from the worksite, ensure that the duration of lead exposure does not extend beyond the work shift, and provide protection to volunteers and their families.

For all restoration projects aboard the battleship *Texas*, only volunteers properly outfitted for hazardous material removal will remove lead-based paint. Strict, detailed procedures will be followed to control and contain paint chips, lead dust, and lead-contaminated debris.

Housekeeping and Personal Hygiene Practices

1. Volunteers will become familiar with the following procedures for preparation and removal of paint chips, lead dust, and lead-contaminated debris:
 - a. The working space(s) should be sealed from the rest of the ship. All furnishings should be removed.
 - b. No eating or drinking will be allowed in the work area.
 - i. All food, drink, and eating utensils should be removed from the space.
 - ii. All surfaces should be covered and sealed.
 - c. All other volunteers, not directly associated with the work, should be kept out of the space until the job is completed.
 - d. Shower facilities should be available so that “exposed” personnel can wash lead from their skin and hair immediately upon contamination and/or prior to leaving the worksite.

Page 2 - SOP – Controlling Lead Exposures

Protective Clothing

2. Volunteers shall wear proper personal protection equipment (PPE).
 - a. These PPE items consist of cloth coveralls or disposable paper suits, gloves, and goggles.
 - i. Use work garments of appropriate size.²
 - ii. This protective clothing should not be worn in other areas of the ship.
 - iii. At no time shall lead be removed from protective clothing or equipment by any means that disperses lead into the work area, such as brushing, shaking, or blowing.
 - iv. Clothing worn in the space(s) should be properly cleaned or disposed of after working.
 - v. Separation of street clothes and protective clothing is essential in preventing cross contamination of the employee's clothing.
 - vi. These measures will prevent taking lead-contaminated dust out of the worksite and home to the volunteer's families.

Respiratory Protection

3. To provide adequate respiratory protection, volunteers should use respirators with approved cartridges.
 - a. Respirators must be donned before entering the work area and should not be removed until the volunteer has left the area, or as part of a decontamination procedure.
 - b. Respirators/with approved cartridges can be worn when chipping hammers or scrapers are being used.
 - c. Respirators with a positive airflow shall be worn when electric wire brushes or pneumatic tools are in use. Electric wire brushes can increase lead exposure up to 70 times the permissible exposure limit and pneumatics up to 4 times the permissible limit.

Work Practice Controls

4. Before removing old paint, qualified ship's staff will check for lead content. Staff will test samples utilizing an approved lead paint test method.
 - a. Staff will take representative paint chips or mark a groove into the existing paint to gain the requisite samples.
 - b. An analysis of the samples will be conducted utilizing a test kit that consists of a water solution mixed with sodium sulfide, specifically designed for this type of test.
 - i. A prescribed number of drops are applied to the paint and if it turns black then we have a positive confirmation for lead.
 - ii. A private lab or other public agency may test our paint samples for lead.
5. Welding and cutting activities can potentially involve exposure to lead. {This work will be done by ship staff}
 - a. Lead exposures are generated when a piece of lead-based painted steel is heated to its melting point either by an oxyacetylene torch or an arc welder.
 - i. In this situation, lead becomes airborne as a volatized component of the coating.

Page 3 - SOP – Controlling Lead Exposures

- b. The following work practice controls will help to reduce volunteer exposure to lead during welding, burning, and torch cutting:
 - i. Strip back all lead-based paint for a distance of at least 4 inches in all directions from the area of heat application.
 - ii. Burning to remove lead-based paint is strictly prohibited.
 - 1. Paint should be removed using other methods, such as chemical stripping, power tools (e.g., needle guns).
 - iii. Ensure that volunteers avoid the smoke plume by standing to the side or upwind of the cutting torch plume.

Proper Disposal Regimen

- 6. Work area(s) will be thoroughly cleaned daily.
 - a. Daily removal of accumulations of paint chips, lead dust, and lead-containing debris will be disposed of in sealed impermeable bags or other closed impermeable containers as provided by our hazardous waste contractor.
 - i. Volunteers will place lead-contaminated disposable coveralls and shoe covers with the lead waste.
 - ii. Cloth coveralls will be secured in a double lined plastic bag and secured shut before they are removed from the DECON station.
 - iii. Bags and containers will be appropriately labeled as lead-containing waste.
 - b. Ship’s staff will then notify the hazardous waste contractor who will take the hazardous materials off premises and dispose of it properly.
 - c. Vacuuming lead dust with high-efficiency particulate air-filtered (HEPA) equipment and/or wetting it with water before sweeping are effective control measures.

Exposure Limits

7. Lead concentrations may vary substantially throughout a work shift as well as from day-to-day. To ensure volunteer’s exposure to lead remains below the permissible exposure limit (PEL) in an 8-hour day, any volunteer working shall be limited to 6 hours. If a volunteer is going to work beyond that 6 hour ceiling or work continuously day in day out he/she must follow and comply with the staff SOP.

EXPIRATION DATE:

Ship Manager

Date

Part 4

Artifact Removal

One item I need to stress: In the FTV office is a log book in a three ring binder that is used to “Authorize” you to remove artifacts from the Battleship Texas. If you remove something without properly checking the item out you are “Breaking the LAW”. Make sure you follow the proper procedures set by Texas Parks and Wildlife department.

“**Take Home**” project items:

In the volunteer office on the right side as you step in you will see four 5-gallon buckets with clip board **attached** to them.

The ship’s staff will place items into these buckets for restoration. On the clip board is an envelope that will have the instructions on “How To” restore that item.

If you decide to work on any of these there is a “**Check-Out**” book located near the bulletin board to “Sign-Out” the Artifacts to be done. **ONLY** the ship’s staff member can authorize you to remove artifacts from the ship. When you sign out the Artifact a ship’s staff member must be present.

Take the “bucket” home with you after you sign it out and when your done bring it back and have a ship’s staff member sign-in that the artifacts were returned.

Don’t forget this last step a “Ship’s Staff” member must sign it back in.

I have been assured that these items we are restoring will be used for display aboard the ship or placed in the locker we are about to work on that will have various artifacts located to be used for tours and education purposes. They will not be placed back into the archives somewhere and not used.