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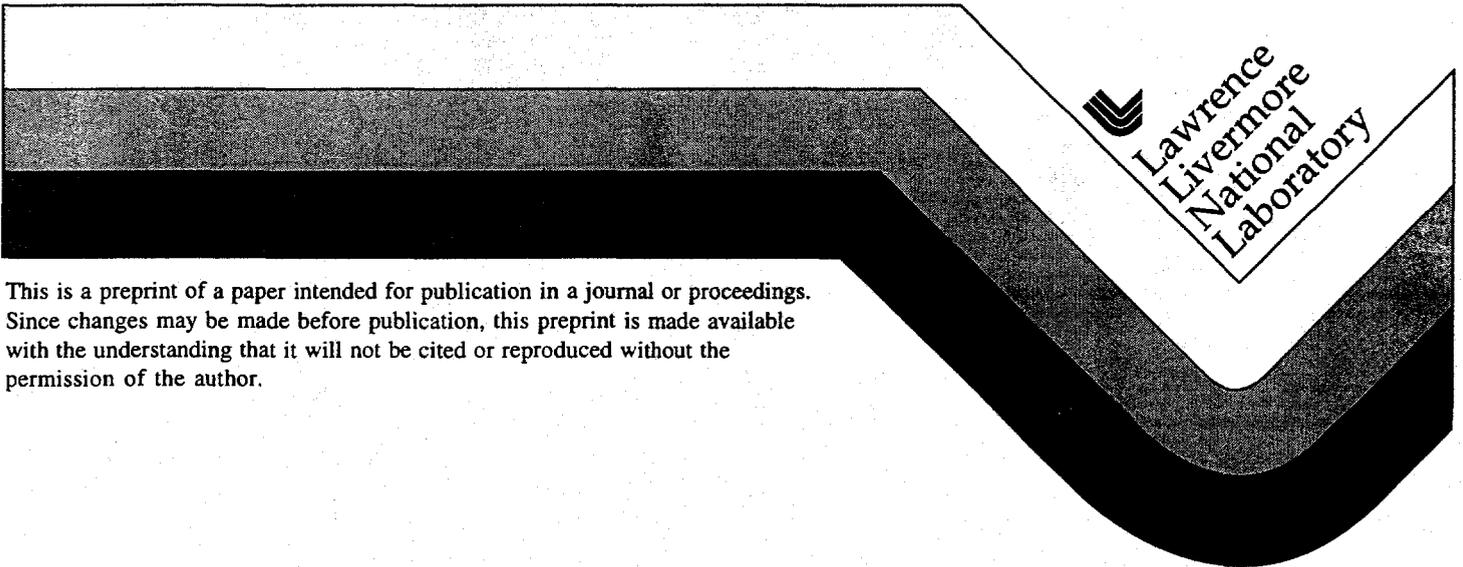
Turning Inspection Regulations into Training Tools

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TURNING INSPECTION REGULATIONS INTO TRAINING TOOLS

prepared by
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ABSTRACT

In response to suggestions from internal and State of California auditors, the Hazardous Waste Management Division (HWM) at Lawrence Livermore National Laboratory prepared an *Inspection Schedule and Guidance Document* that summarizes the Laboratory's inspection schedule and procedures for waste treatment, storage, and disposal facilities (TSDFs). Because it explains and comments in detail on the inspection schedule, forms, and procedures, this document is a centralized reference for HWM managers and personnel performing TSDF inspections at the Laboratory. It is also a training tool for experienced and new inspectors, standardizing the inspections of personnel with experience and explaining to novices what to look for and why. This poster presentation traces the team effort that created this document and provides specific examples of how the document was developed and how it is used.

THE REGULATORY FRAMEWORK

The environmental regulations governing the hazardous waste treatment, storage, and disposal facilities (TSDF) at Lawrence Livermore National Laboratory (LLNL) are basically the same as those governing any TSDF anywhere in the United States. Although our regulator and permitter is the California Department of Toxic Substances Control (DTSC), the regulations we must abide by are those of the U.S. Environmental Protection Agency (EPA) and the Resource Conservation and Recovery Act (RCRA). The EPA has given CDTSC authority over waste management operations at LLNL and throughout California because CDTSCs regulations are as stringent as or more stringent than EPA's and RCRA's.

So, what is true of waste management operations as a whole is therefore true of the inspections of the TSDFs at the Laboratory that keep them safe. At LLNL, waste management operations are the responsibility of the Hazardous Waste Management Division (HWM), a part of the Laboratory's Environmental Protection Department (EPD).

Both federal (40CFR264.15 - General Inspection Requirements) and State of California (22CCR666264.15 - General inspection Requirements) regulations require that an owner or operator of a hazardous waste management facility must inspect the facility for malfunctions and deterioration, operator errors, and discharges that may be causing or may lead to (1) release of hazardous waste constituents to the environment or (2) a threat to human health.

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These regulations provide a general framework for inspections but rely on the owner or operator to provide the specifics in terms of what units are inspected and the format of that inspection. However, the regulator has approval and audit authority over all of the above, and ultimately, the inspection schedule and its particulars are subject to regulatory approval.

The owner or operator must develop and follow a written schedule for the inspection (i.e., an inspection log or checklist) of monitoring equipment, safety and emergency equipment, security devices, and operating and structural equipment (such as dikes and sump pumps) that are important to preventing, detecting, or responding to environmental or human health hazards. The inspection schedule must be kept at the facility and the schedule must identify the types of problems that are to be looked for during the inspection.

Specifically, the regulations require that aboveground portions of all tank systems be inspected **once each operating day** to detect corrosion or release of waste. Regulations covering tanks also include a schedule and procedure for inspecting overall controls. Data gathered from monitoring and leak detection equipment must be inspected to ensure that the tank system is being operated according to its design. The construction materials and the area immediately surrounding the externally accessible portion of the tank system, including the secondary containment system, must be inspected daily to detect erosion or sign of releases of hazardous waste. The owner/operator must document all of these items on a daily basis.

Once each week (every 7 days), all container storage units must be inspected. During these inspections, the emphasis is on a wider range of issues (e.g., safety equipment, labeling, compatibility, etc.) as well as on leaks and spills.

Finally, other areas subject to spills but not always in continuous use must be inspected **daily when-in-use**. Examples are loading and unloading areas, container storage areas not in constant use, treatment and filtration units used intermittently, and staging areas used for temporary placement of waste during facility moves or prior to shipment.

IMPLEMENTATION OF THE REGULATIONS AT LLNL

The Hazardous Waste Management Division at LLNL has had an inspection program in compliance with federal and state regulations in place for many years. Over the years, the forms for the daily, weekly, and daily when-in-use inspections have evolved to cover the Laboratory's expanding and increasingly complex waste management and treatment needs, and the inspection process includes fairly complex corrective action and close-out procedures to make sure that health and safety issues revealed by the inspections are resolved.

Several years ago after an audit of the Laboratory's inspection schedule and process, State of California auditors requested that HWM prepare a guidance

document that would summarize the Laboratory's TSDf inspection schedule and procedures and explain and comment on them as a centralized reference source for the HWM managers and personnel performing these inspections. In addition, our in-house quality assurance personnel came to a similar conclusion following an internal audit of the adequacy of HWM's inspections and the effectiveness of state/federal inspection program implementation. HWM therefore agreed to prepare and update annually an inspection schedule and guidance document. This document is not a procedure as defined at LLNL, but it has been formalized by the "controlled document" process and is readily available to all supervisors and inspection personnel. The inspection logs upon which this guidance document is based are included with the Laboratory's Part B Permit Application and its revisions and updates.

Document Development Team and Resources

The task of preparing and updating this *Inspection Schedule and Guidance Document* fell to HWM environmental scientists. The environmental scientist assigned the task formed a team that included an editor/writer and managers and supervisors of HWM storage yards and treatment facilities.

The environmental scientist and the editor/writer reviewed all of the existing inspection forms with the members of the team to determine the scope of each kind of inspection—daily, weekly, and daily "when-in-use"—and its general compliance with RCRA regulations. They also reviewed each individual inspection form with their contacts from HWM operations to learn the particulars of each feature of each storage area or treatment facility inspected. They accompanied inspectors on numerous daily and weekly inspections of all storage areas and treatment facilities to become knowledgeable first hand of what specifically was being inspected, how, and why. The goals of this long and sometimes arduous process were first to learn the inspection forms and processes up close and then to reconcile, insofar as possible, differences in inspection forms and practices from one part of HWM's facilities to another as well as to standardize the forms accordingly based on the input and consent of those responsible for the inspections.

Then the environmental scientist and editor/writer set about making minor revisions in the forms and drafting the *Inspection Schedule and Guidance Document*. They chose an "Information Mapping"* format for the document because of its reader friendliness and organized the document around the basic types of

* Information Mapping is a copyrighted system of presenting information developed by Robert E. Horn of Information Mapping, Inc., Waltham, Massachusetts. The system is a reader-friendly way of presenting many different kinds of information and is particularly useful for developing and presenting procedures, policies, and documentation. More information on Information Mapping seminars is available from Information Mapping, Inc. 3000 Third Avenue, Waltham, Massachusetts 02154, (617) 890-7003.

inspections—daily, weekly, and daily “when-in-use,” adding appendices for each type of form where samples of all the forms are collected as well as an appendix for the National Fire Protection Association (NFPA) 704 System signs and one explaining the various classes and types of fire extinguishers.

After an initial draft of the document was completed, it went through an extensive review process that included HWM management and supervisory personnel, a seasoned representative from the EPD’s Operations and Regulatory Compliance Division (ORAD), and experienced HWM inspection personnel. The guidance provided by the document was revised repeatedly and extensively based on the input of these various reviewers before its ultimate review and approval by top HWM managers, publication, and distribution.

The Document Development Process

To provide a sense of how we developed the guidance provided by the *Inspection Schedule and Guidance Document*, we will focus on one part of one inspection form and the development of the guidance provided there. We have chosen the General Facility section of the Weekly Inspection Log for Area 514 Facility Storage Units. Figure 1 shows the entire Weekly Inspection Log for the Area 514 Facility Storage Units; Figure 2 shows the General Facility Section of that log. We will concentrate on the part of the General Facility section dealing with emergency equipment, Question 10, and discuss how our research, team interaction, interviews, tours, and staff reviews led us to the guidance provided by the document.

Question 10 of the General Facility section of all weekly logs for all facility storage units is the same and asks for evaluation of the functionality and accessibility of fire extinguishers, showers, eyewashes, and telephones/paging system. According to our investigation of the inspection process, this part of the weekly inspection logs did not need to be revised, but it did need extensive clarification and explanation.

Fire Extinguishers. Through discussions with facility supervisors, HWM inspection personnel, and our ORAD contact, we discovered that all fire extinguishers in HWM’s facilities—and, indeed, at the entire Laboratory—are examined at least every 12 months by the Laboratory’s Fire Department to ensure that they are charged and in proper, safe working order. This inspection is documented on an inspection tag attached to the extinguishers. Thus, one of the first jobs of an HWM facility inspector is to examine the inspection tag to see that the extinguisher has been inspected within the last 12 months. They then look at many of the same features of the extinguishers that are examined by Fire Department inspectors. For example, they must inspect the no-tamper seal attached to the pin that must be pulled to activate the extinguisher to see if the seal is present and remains unbroken. They look at the pressure gauge to see that it is in the operating range. They also examine other salient features of the extinguisher, such as the hose and nozzle, for defects and wear. And they affirm that the extinguisher is unobstructed and visible, that the operating instructions

on the nameplate are legible and facing outward, and that the unit is properly mounted off the ground or floor. Finally, the HWM inspector dates and initials the inspection tag. If, however, all is not well with a given extinguisher or extinguishers, the inspector notes this fact on the inspection form and follows the guidance in Section IV. Corrective Action and Close-Out to correct the problem(s).

As a supplement to the section on fire extinguishers, we included an appendix on the types of fire extinguishers available. We used the National Fire Code and a booklet entitled "Fire extinguishers: Your small fire NFPA Defense" to develop the appendix. The information is intended to serve as a quick reference for the technicians who attend specific training on this subject. We included the symbols for the classes of fires and types of extinguishers and other symbols that might be found on the extinguisher. These symbols include pictographs indicating what type of material the extinguisher is used for, e.g., trash, wood, liquids, grease, electrical equipment. Appendix E also explains the relative rating on Class A and Class B extinguishers. It also has an important reminder to the HWM inspector. In the event of a fire in the treatment and storage facilities, employees should call 911 immediately to report the fire. They should use a fire extinguisher to fight a fire **ONLY** if they are trained to do so and know, based on the training, that the extinguisher is appropriate to the kind of fire present.

Showers. All emergency showers and eye washes in HWM facilities are physically collocated, but because they have different purposes and function somewhat differently, they are covered separately in the guidance document so that the inspector will look at each piece of equipment in its own right. Both, however, must be accessible if they are to be used in an emergency. Therefore, one of the inspector's primary jobs is to make sure that the "Keep Clear" caution at the unit is being observed and that the unit is unobstructed and can be accessed quickly in an emergency.

From the experience of HWM personnel and that of our advisors in ORAD, we learned that other basic concerns with the showers are that the water (1) must be easily and quickly turned on, (2) must stay on by itself, and (3) should flow at a constant rate and sufficient pressure to do its cleansing work. We have provided guidance accordingly. In addition, we caution inspectors to capture the water generated by their tests in a large bucket stored near the shower so that the bermed area around the shower stays dry and the inspection tests do not, therefore, create a cleanup problem. Satisfied that the shower is working properly, the inspector initials and dates the tag attached to the shower. Again, if there are problems with a shower, the inspector notes the deficiencies on the inspection form and follows the guidance in Section IV of the guidance document to correct the problem.

Eye Wash(es). Basically, the inspection guidance concerns for the eye washes are the same as those for the showers—flow initiation, rate, pressure. However, because the water from the eye washes is used to cleanse the eyes, it is important that the inspector also checks to see that it is free of rust by checking water clarity

and color. Also, the eyewashes have two nozzles, both of which should be operating at equal pressure and flow rate, and these nozzles are protected when the eye wash is not being used by caps. The water pressure should be sufficient to pop these caps off when flow is initiated; the caps need to be replaced after inspection and testing.

Telephone(s)/Paging System. Phones are found throughout our waste management facility. However, some of the phones are rarely used, so it is important to test them on a weekly basis to assure that they are working. The inspector tests the phone by calling the HWM operator. HWM's paging system is connected in the two largest of our facilities, the Facility 612 Area and the Facility 514 Area. To test them, the inspector calls the appropriate number listed in the guidance document. Again, the inspector reports his finding in the prescribed way on the inspection form and schedules remedial action if a deficiency is found as described in Section IV of the guidance document.

To illustrate the document development process and how it influenced the guidance provided, we have intentionally chosen a simple example with obvious health and safety implications. We should note, however, that the Hazardous Waste Management storage and treatment facilities inspected at Lawrence Livermore are numerous and include complex, sophisticated waste treatment equipment and storage areas containing many kinds of both hazardous and low-level radioactive waste. Yet the process used to develop guidance for this equipment and these storage areas was essentially the same as that used for the less complex emergency equipment discussed above. Through a variety of means—accompanying inspectors on their rounds, discussions with facility personnel and managers, reviews by in-house experts, research of the regulations—we sought to get to the heart of the area or piece of equipment being inspected, to see what made for its safe operation within regulatory guidelines. Our goal was to provide the inspector with a clear sense of what to look for and why in order to assure a thorough and complete inspection. Such inspections are an important way of promoting the safe operation of equipment and storage of waste as well as the health and safety of those who use that equipment and maintain those storage facilities.

RESULTS

The *Inspection Schedule and Guidance Document* puts the inspection process in Lawrence Livermore's waste treatment and storage facilities into a comprehensive plan. Rather than a set of individual forms and a loose set of procedures for regulatory-driven inspections, we now have an organized approach to the complete inspection process that can serve as a refresher for experienced inspectors and a training tool for novices.

In one place, HWM inspectors and their managers can find:

- The inspection logs.

- A discussion of the rationale behind and the regulatory basis for inspections.
- A schedule of inspections.
- A compendium of what facilities get inspected how frequently.
- Procedures for documenting inspection findings, initiating repairs, and following up to ensure that a deficiency has been corrected.
- And perhaps most important of all, what to look for in particular when doing an inspection of a specific area or piece of equipment.

The Information Mapping format of the document makes it easy to follow and use. And an annual update of the *inspection Schedule and Guidance Document* ensures that the information about the inspection logs, the inspection process, and the equipment and facilities being inspected is kept current.

This work was performed under the auspices of the U.S. Dept of Energy at LLNL under contract no. W-7405-Eng-48.

WEEKLY INSPECTION LOG FOR AREA 514 FACILITY STORAGE UNITS

Inspector's Name (print) _____ Date _____ Time Inspected _____

Instructions: Mark "✓" for yes, "X" for no, and "NA" for not applicable. For each "X" entered, write a complete explanation in the comments section.

GENERAL STORAGE UNIT	513 Container Storage	514-1	514-2	514-3
1. Is area free of spills and leaks?				
2. Is area posted with appropriate hazard and cautionary signs?				
3. Is aisle space adequate for stored hazardous waste?				
4. Is containment system in good condition?				
CONTAINERS				
5. Are all containers properly labeled and are labels in plain view for inspection?				
6. Are labels legible and complete?				
7. Are containers in good condition, no flaking rust, structural defects, leaking, bulging, or weeping containers?				
8. Is separation adequate for incompatible wastes?				
9. Are ignitable wastes isolated from sources of ignition and at least 50 ft from LLNL property line?				
GENERAL FACILITY	✓/X/NA			
10. Is emergency equipment functional and accessible? Fire Extinguisher(s) Shower(s) Eyewash(es) Telephone(s)/Paging System		*Spill kit contents are tested for integrity on a quarterly basis in the months of January, April, July, and October.		
11. Is decontamination equipment functional and readily available?				
12. Are all emergency spill kits complete (sealed)?* Provide date of last quarterly integrity check _____				
13. Are all gates and doors locked when not in use by HWM?				
14. Are the required warning signs posted at the entrances and other locations outside the facility in sufficient numbers to assure their visibility from all approaches?				
15. Are warning signs legible from 25 ft?				

Inspection completed by (signature) _____

Supervisor reviewed this inspection form (signature) _____ Date _____

Item No.	Area	Date	Comments/Corrective Action Needed	SSR No (if applicable)	Nature of Repairs	Date Completed	Completed By

Space is provided for additional Comments/Corrective Actions on the back of this form.

Supervisor acknowledges that all deficiencies have been corrected _____

Date _____

Figure 1. Weekly Inspection Log for Area 514 Facility Storage Units

GENERAL FACILITY		✓/X/NA
10. Is emergency equipment functional and accessible?		*Spill kit contents are tested for integrity on a quarterly basis in the months of January, April, July, and October.
Fire Extinguisher(s)		
Shower(s)		
Eyewash(es)		
Telephone(s)/Paging System		
11. Is decontamination equipment functional and readily available?		
12. Are all emergency spill kits complete (sealed)?* Provide date of last quarterly integrity check _____		
13. Are all gates and doors locked when not in use by HWM?		
14. Are the required warning signs posted at the entrances and other locations outside the facility in sufficient numbers to assure their visibility from all approaches?		
15. Are warning signs legible from 25 ft?		

Figure 2. General Facility Section of the Weekly Inspection Log for Area 514 Facility Storage Units

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