PLAINTIFF'S EXHIBIT A-0-8

Introduction to Safety Inspection

THE NECESSITY FOR REGULAR SAFETY INSPECTIONS

Section 8, in Chapter 3, emphasized the necessity of detecting all unsafe conditions promptly. The principle involved is beyond dispute. The same section also pointed out that safety inspections are the main tools for detecting unsafe conditions. Again, no one is likely to dispute that. Everyone agrees there must be some kind of safety inspection. However, disagreement often does occur when there is a call for putting safety inspections on a *regular, systematic basis for all supervisors*. The disagreement arises largely because so many supervisors look upon safety inspections as "keeping ones eyes open", or "something to do whenever there is time", or "something for the safety man to take care of". Underlying such views is a failure to understand why regular safety inspections are necessary. Moreover, where such views prevail, a great many unsafe conditions are not detected until they are revealed by the cold light of an accident.

The main reason why safety inspections must be organized on a regular systematic basis stems from the fact that *unsafe conditions are continuously being created. First, there is the normal "wear and tear" process that is always at work.* Pipes corrode. Cable strands break. Insulation rots away. Handtools develop defects. With use, all things tend to wear out. In the process, unsafe conditions are born. *Secondly, there are the actions of men that create unsafe conditions.* Materials are left in hazardous locations. Tools are abused and rendered unsafe for the next man to use. Guards are removed and not replaced. Safety devices are made inoperative. Wherever men work, some will create unsafe conditions through honest ignorance, or gross neglect, or even deliberate wilfulness.

The end result of these two source causes is a steady trickle of unsafe conditions into virtually every place of work. The situation is somewhat like a boat with a leaky bottom. Unless the water is bailed out regularly, such a boat would soon be swamped. Similarly, unless unsafe conditions are ferreted out by regular safety inspections, most workplaces would soon be swamped with them. *And that is when accidents begin to pile up.*

INCIDENTAL VS. PLANNED SAFETY INSPECTIONS #137

Broadly stated, there are two kinds of safety inspections. They are:

1. *The incidental inspection.*
2. *The planned inspection.*

Let's discuss each type generally.

THE INCIDENTAL INSPECTION

The incidental inspection is largely a matter of inspecting for unsafe conditions on a keep-your-eyes-open basis. Most supervisors inspect their areas that way. As they go from one place to another, they keep their eyes open for unsafe conditions. Such inspection is useful. It does spot many unsafe conditions. However, it also has serious limitations. Incidental inspection usually misses the things that take extra effort to see. It does not get into the out-of-the-way places. It tends to be superficial and erratic. Moreover, when supervisors become engrossed with thinking about problems while on the go, incidental inspection virtually ceases. The eyes may see, but nothing much registers on the

preoccupied mind. In short, incidental inspection is desirable, but it needs to be supplemented by something more deliberate and planned.

THE PLANNED INSPECTION

The planned inspection is deliberate and thorough. The supervisor knows his area of inspection responsibility. He knows what items, e.g. tools, equipment, machines, etc. require regular inspection by him. He knows what conditions to look for when he checks any item. He knows how frequently each item should be inspected. When he sets out to inspect, he has in mind what items he will inspect. He may even be guided by a checklist on which he can record his inspections and findings. Inspection of this kind is systematic. It does not leave things to chance. For that reason, it is much more likely to spot unsafe conditions than incidental inspections.

ARE BOTH KINDS NECESSARY?

Both the incidental and the planned approach to safety inspection are necessary. One supplements the other. The informal, keep-your-eyes-open type of inspection fills in the gaps between planned inspections conducted at regular intervals. The latter, in turn, makes certain that items requiring periodic inspection are not overlooked. Between these two approaches very few unsafe conditions should go undetected for long.

THE BASIC STEPS OF A SAFETY INSPECTION INVENTORY

Before safety inspections can be applied in a regular, systematic, and planned way to any plant area, one needs to know the details of the inspection problem. One needs to know, for example, who is responsible for what inspection areas; what are the items in any given area that require regular inspection; what conditions should be looked for when inspecting the items; how frequently should the items be inspected; who should inspect what items; and finally, what items require special equipment and techniques for inspection. The way to know these things is to do a safety inspection inventory.

An inspection inventory is a thorough analysis of the safety inspection problem. It is the foundation upon which a program of planned safety inspection rests. It can be applied to a plant, a department, a section, *or a smaller area for which a first-line supervisor is responsible.* Six basic steps are involved:

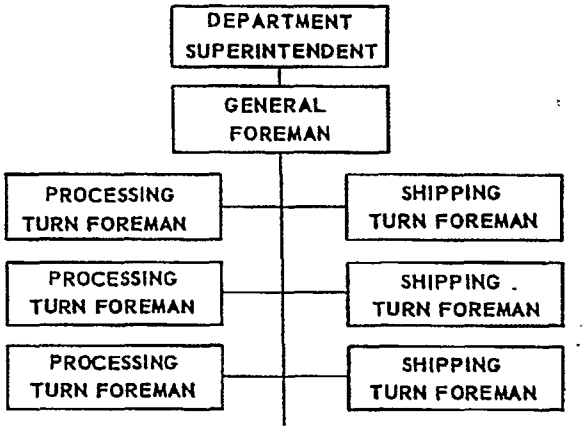
1. *Define the inspection areas.*
2. *Decide what items to inspect.*
3. *Decide what item parts to inspect.*
4. *Decide what conditions to inspect for.*
5. *Decide how often items require inspection.*
6. *Decide who should inspect what items.*

Let's discuss each step generally. Later, the details of how to record a safety inspection inventory will be described.

DEFINING INVENTORY AND INSPECTION AREAS

The first step in defining inspection areas is to define the plant areas for which each department is responsible. Ideally, the total plant area should be so subdivided that there is no area that is unassigned to either a plant department or general plant administration. Each department must know exactly what building and yard areas comprise its territory. Once the boundaries of where one department ends and another begins have been defined, they should be marked on a plant map so there will be no question about what departments are responsible for what building and yard areas.

Let's assume all departments know their area of responsibility. How does a department subdivide itself into inspection areas? The answer is best explained by assuming an imaginary department organized as shown below.



The organization chart tells us the department consists of two operations, processing and shipping, with each supervised by a turn (shift) foreman. A general foreman is in charge of both operations. He, in turn, is responsible to a department superintendent. A simplified layout of the department is shown in Fig. 1.

When a safety inspection inventory is to be done for a large area that contains sub-areas which are normally the responsibility of specific supervisors, the practical principle to follow is to have each supervisor inventory the area where several supervisors share the responsibility for a single area by working on different turns or shifts, the inventory is best done jointly by the supervisors. Thus, in our hypothetical department, the processing turn foremen would inventory the processing area and the shipping turn foremen would inventory the shipping area.

The above principle, applied to our imaginary department, actually means three areas need to be defined. First, the boundaries of the over-all department area need to be defined so all concerned know where the department ends physically and neighboring departments begin. Second, the boundaries of the processing area must be defined so processing turn foremen know what constitutes their area. Third, the boundaries of the shipping area must be defined for the same reason. In a real situation, all such boundaries should be well-defined and understood.

The floor plan shown in Figure 1 has gone a step further. It shows how each of the turn foremen have been assigned a sub-area for inspection purposes. That means each turn foreman will be responsible for general housekeeping in all three sub-areas of his operation whenever he is on turn, but *planned* inspection activities will be limited to assigned areas. It is generally a good idea to change sub-area assignments every six months. Rotation will make each turn foremen familiar with each sub-area from a planned inspection viewpoint. Sometimes a department will completely surround an area that belongs to another department. For example, assigned maintenance personnel will have an area assigned to them where they keep their tools and equipment. Where such "islands" are formally recognized as the property of another department, they should be excluded from the safety inventory of the surrounding department. They must be included in the safety inventory of the responsible department.

There should be no no-man's land. Some one should be responsible for every square foot of departmental space.

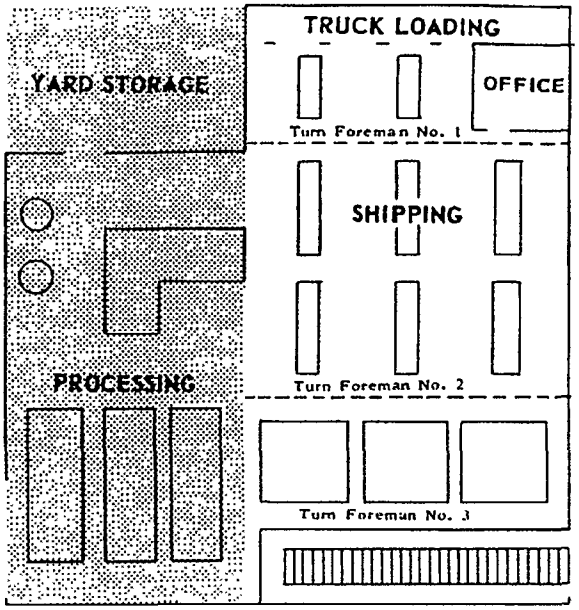


FIG. 1. Simplified layout of a department. The dotted lines shows how the area has been sub-divided for inspection purposes. Each shipping turn foreman has been assigned a specific area for planned inspection purposes. In addition, each is responsible for general housekeeping in the entire area when on turn.

The definition of inventory and inspection areas should be the responsibility of the department head. Once decided, the definition of areas is best done graphically, and posted so there is no misunderstanding as to who is responsible for what area, and where responsibility begins and ends. In the floor layout above, the two areas are defined by different overlay markings. In actual practice, it is easier to use varied colors to demarcate areas. Good quality crayons are excellent for that purpose. Where several areas and many supervisors are involved on a single floor plan, the color coded areas can be keyed to supervisor titles or names. The posting of such layouts should be permanent so as to be a continuing reminder of which supervisors are responsible for what area.

DECIDING WHAT TO INSPECT

The next step is to decide what items, that is, tools, equipment, machines, structures, supplies, etc. require regular inspection in each area for safety and housekeeping purposes. The idea is to develop a list of such items, based upon knowledge of what, where, and how unsafe conditions have occurred in the past. Accident records are also a good source of ideas about what items require regular inspection.

Generally speaking, consideration should be given to items that fall into the following categories:

1. *ATMOSPHERIC CONDITIONS,* e.g. dusts, gases, fumes, sprays; also illumination.

2. *BUILDINGS AND STRUCTURES,* e.g. windows, doors, floors, stairs, roofs, walls, etc.

3. *CONTAINERS,* e.g. scrap bins, disposal receptacles, barrels, carboys, gas cylinders, solvent cans, etc.

4. *ELECTRICAL EQUIPMENT,* e.g. switches, cables, outlets, connectors, grounds, connections, etc.

5. *ELEVATORS, ESCALATORS, AND MANLIFTS,* e.g. cables, controls, safety devices, etc.

6. *FIREFIGHTING EQUIPMENT,* e.g. extinguishers, hoses, hydrants, sprinkler systems, alarms, etc.

7. *HANDTOOLS,* e.g. bars, sledges, wrenches, hammers, etc.; also power handtools.

8. *HAZARDOUS SUPPLIES AND MATERIALS,* e.g. flammables, explosives, acids, caustics, toxic chemicals, etc. How & where are they stored?

9. *MATERIAL HANDLING EQUIPMENT,* e.g. conveyors, cranes, hoists, fork lifts, etc.

10. *PERSONAL PROTECTIVE EQUIPMENT,* e.g. hard hats, safety glasses, respirators, gas masks, etc.

11. *PRESSURIZED EQUIPMENT,* e.g. boilers, vats, tanks, piping, hosing, etc.

12. *PRODUCTION AND RELATED EQUIPMENT.* Any equipment that processes materials into more finished products, e.g. mills, shapers, cutters, borers, presses, lathes, etc.

13. *PERSONNEL SUPPORTING EQUIPMENT,* e.g. ladders, scaffolding, high platforms, catwalks, sling chairs, staging, etc.

14. *POWER SOURCE EQUIPMENT,* e.g. gas engines, steam engines, electrical motors, etc.

15. *STRUCTURAL "OPENINGS",* e.g. shafts, pits, sumps, and floor openings, including those usually kept covered.

16. *STORAGE FACILITIES AND AREAS,* e.g. racks, bins, cabinets, shelves, tanks, closets, etc; also yard and floor storage areas.

17. *TRANSPORTATION EQUIPMENT,* e.g. automobiles, trucks, railroad cars, motorized carts, buggies, etc.

18. *WALKWAYS AND ROADWAYS,* e.g. aisles, ramps, docks, walkways, vehicle ways, etc.

19. *WARNING AND SIGNALLING DEVICES,* e.g. crossing lights, blinker lights, sirens, claxons, warning signs, etc.

20. *MISCELLANEOUS.* All items that do not fall into any of the above categories.

DECIDING ITEM PARTS TO INSPECT

When a tool, machine, structure, or item of equipment is inspected, attention is directed at those parts that are subject to developing unsafe conditions. Therefore, the third step of an inspection inventory is to decide exactly what parts of an item should be inspected regularly.

Consideration should always be given to parts that are susceptible to damage, deterioration, or defects from stress, impact, vibration, corrosion, rusting, abrasion, pressure, moisture, heat, and freezing. Also give consideration to parts that fall into the following categories:

1. *PROTECTIVE GUARDS,* e.g. gear covers, pulley belt screens, workpoint guards, railings, etc.

2. *SAFETY DEVICES,* e.g. safety valves, emergency cut-offs, warning systems, limit switches, etc.

3. *CONTROL COMPONENTS,* e.g. start-up switches, steering mechanisms, speed controls, manipulating controls, etc.

4. *MECHANICAL POWER COMPONENTS,* e.g. gears, cables, belts, drives, shafts, chains, etc.

5. *ELECTRICAL POWER COMPONENTS,* e.g. cables, wires, switches, connections, grounds, etc.

6. *POINT-OF-LIFT COMPONENTS,* e.g. handles, eyebolts, lifting lugs, etc.

7. *POINT-OF-WORK COMPONENTS,* e.g. parts that grind, drill, cut, hammer, press, shape, etc.

8. *WEIGHT-BEARING COMPONENTS,* e.g. steps, rungs, brackets, "legs", foundations, etc.

DECIDING WHAT CONDITIONS TO INSPECT FOR

A knowledgeable inspector should know what unsafe conditions to look for when he inspects tools, equipment, machines, and other items. Therefore, the fourth step of an inspection inventory is to decide and specify exactly what unsafe conditions are to be checked for when inspecting an item or part thereof.

It is usually sufficient to describe the unsafe conditions in brief, qualitative expressions, e.g. broken, loose, cracked, leaking, frayed, or spalled. There are literally dozens of such one-word expressions that tell the story of what conditions to look for. Sometimes, however, it is necessary to describe a condition in a precise, quantitative way. For example, a maximum permissable gas concentration would have to be described precisely with a quantitative, that is, a "how much" expression. The same exactness would be called for when describing maximum pressure levels, minimum fluid levels, and other kinds of critical points.

DECIDING HOW OFTEN ITEMS REQUIRE INSPECTION

Inspecting anything more often than necessary is costly. Inspecting less often than necessary is chance-taking. Therefore, the next step of a safety inspection inventory is to decide and describe how frequently items should be inspected.

The frequency of inspection for any given item must usually be a matter of judgment that balances out several factors. First, there is the potential severity of injury that might result should an undetected unsafe condition cause an accident. For example, the injury severity potential of a defective brake on an overhead crane is undisputably greater than that of a splintery hammer handle. Other things equal, the greater the injury potential, the more frequent should be the rate of inspection. Second, there is the degree of personnel exposure to a potential unsafe condition to consider. For example, a walkway that gets heavy employee traffic warrants more frequent inspection for tripping and slipping hazards than one that is rarely used. Other things equal, the greater the personnel exposure to a a potential unsafe condition, the more frequent should be the rate of inspection. Third, there is the matter of how quickly the item is likely to develop an unsafe condition. Some tools and equipment are subject to a great deal of use, abuse, and misuse. Others get relatively little use or rough treatment. Since the former are more likely to develop unsafe conditions sooner, it makes sense to inspect them more frequently.

DECIDING WHO SHOULD INSPECT ITEMS

Not all persons are equally qualified to inspect *all* items that may require regular inspection in a given area. Therefore, the sixth step of the safety inspection inventory is to decide who is to be responsible for inspecting each item. As a rule, the supervisor in charge of an area is the one who should be responsible for inspecting items requiring regular inspection in his area. Exceptions are those items that require inspection by specialists, e.g. motor inspectors, crane inspectors, and boiler inspectors. Many items may also call for a dual inspection responsibility. For example, handtools should be inspected regularly by the users and also by a supervisor. The latter would inspect such items less frequently than the users.

DOING A SAFETY INSPECTION INVENTORY

Doing a safety inspection inventory means making a record of what items require inspection, the critical parts that must be checked, the unsafe conditions for which the items or parts thereof must be checked, and so on. Therefore, some organized way of recording such information is needed. Figure 2 shows a worksheet designed for that purpose. It also illustrates how the information is recorded.

Before discussing how to use the worksheet to do a safety inspection inventory, one point needs emphasis: *The safety inspection inventory is essentially a one-time job.* It is a one-time job analysis of the inspection requirements of a given area. Once recorded, it needs revision only where changes in facilities and equipment require changes in inspection routines.

USING THE ANALYSIS WORKSHEET

There are six parts to the analysis worksheet. Let's discuss each briefly:

1. ***Checking inspection categories.*** The worksheet lists 20 inspection categories. Not all are necessarily applicable to every inspection area. For example, your area may contain no "elevators and manlifts", nor "pressurized equipment", nor "power source" equipment. This step requires you to consider each category, and to check it if you think it is applicable to your area.

   As an alternative to placing check marks in front of the applicable categories, you can number the boxes to establish the order in which you intend to analyze each category.

2. ***Listing inspection items.*** A category selected for analysis is recorded as shown in Sect. 2 of Fig. 2. Then, one by one, the items falling within the inspection category are analyzed as shown in Fig. 2. The procedure is as follows: First, the title of an item is recorded. Then, the item is analyzed thru at least Steps 3 and 4 before the next item title is recorded. Steps 5 and 6 can be applied immediately after Steps 3 and 4 or they can be applied at a later time. Correct titles are used when recording items or parts thereof to avoid misunderstanding later. The object of this step is to list all items that require regular inspection by someone.

3. ***Listing critical parts.*** Drawing upon your experience and knowledge, establish what parts of the item under consideration should

ARMCO SAFETY INSPECTION INVENTORY

DEPARTMENT _____ INSPECTION AREA _____

RESPONSIBLE SUPERVISOR _____ APPROVED BY _____

1. INSPECTION CATEGORIES: Check those categories below applicable to your inspection area. For example, if you have FIREFIGHTING EQUIPMENT in your area requiring regular inspection, check that category. Similarly, if HANDTOOLS are used and stored in your area, check that category. Not all categories are necessarily applicable. Check only those that are applicable.

1. ☐ Atmospheric Conditions	5. ☐ Elevators & Man Lifts	9. ☑ Material Handling Equipt.	13. ☐ Supporting Equipment	17. ☐ Transportation Equipt.
2. ☐ Buildings & Structures	6. ☐ Firefighting Equipt.	10. ☐ Pers. Protective Equipt.	14. ☐ Power Source Equipt.	18. ☐ Walkways & Roadways
3. ☐ Containers & Tanks	7. ☐ Hazardous Materials	11. ☐ Pressurized Equipment	15. ☐ Shafts, Pits, Sumps, etc.	19. ☐ Warning & Signalling Equipt.
4. ☐ Electrical Equipment	8. ☐ Handtools	12. ☐ Production Equipment	16. ☐ Storage Equipt. & Areas	20. ☐ Miscellaneous

2. INSPECTION ITEMS?	3. PARTS TO INSPECT?	4. CONDITIONS TO INSPECT FOR?	5. HOW OFTEN?	6. BY WHOM?
Record one of the above checked categories on the first line below. Record underneath the category title one item in your area that falls within the category. Then, complete Steps 3 and 4 for that item. Record a second item in line with the first blank space after the information recorded for Steps 3 and 4. Repeat the same for all items that fall within the category. Repeat the same for all checked categories. Use correct titles and nomenclature to identify items. Do not use nicknames or expressions that may become meaningless in time.	Identify those parts of each item that require regular inspection, e.g. guards, safety devices, controls; weight-bearing, lift-point, and work-point components; electrical and mechanical power components, etc. Consider parts or components likely to develop unsafe conditions because of stress, wear, impact, vibration, corrosion, heat, misuse, abuse, etc. Record each part on a separate line. Complete Step 4 for each part before recording another part. If Step 4 for a given part requires more than one line, record the next part or component in line with the next blank space in column 4.	Identify and record the specific unsafe conditions for which each part or component should be inspected. When appropriate, use a single word to describe the condition, e.g. "broken", "loose", "spalled", "kinked", "inoperative", "worn", "defective", "frayed", "corroded", "deteriorated", "unstable", "unbalanced", "slipping", "crooked", "leaking", "rotted", "dull", "tattered", "debris", "mutilated", "gas", "fumes", "combustible", "holes", etc. Give a more precise description of the unsafe condition to inspect for when necessary. Give a quantitative description when called for.	Indicate frequency of inspection by recording the appropriate abbreviation for each item or part thereof. BU - before use BI - before issue WS - when serviced D - daily W - weekly M - monthly Q - quarterly Y - yearly	Record who should inspect the item or part. Consider who is qualified by knowhow, availability, and logical responsibility. Use abbreviations: AS - area supervisor; U - user; O - operator. Develop other abbreviations as needed. Use two abbreviations to indicate dual responsibility, e.g. O/AS
MATER. HNDLNG. EQUIPT.	—	—	—	—
O.H. Travelling Crane	hoisting cable	broken strands, defects	D/W	O/QI
	sheave wheels	chipped, broken	D/W	O/QI
	drum	rough edges, defects	D/W	O/QI
	brakes	worn, broken	D/W	O/QI
	bridge	alignment	D/W	O/QI
	collector shoes	worn, pitted, loose, broken	D/W	O/QI
	limit switches	inoperative, missing	D/W	O/QI
	safety guards	bent, broken, missing	D/W	O/QI
	warning signal lights	broken, burned out	D/W	O/QI
	gears	low on lubricant	D/W	O/QI
Boom Tractor	horn	inoperative	D/M	O/AS
	tires	pressure, tears, wear	D/M	O/AS

CONTINUE ON THE NEXT SIDE

FIG. 2. SAFETY INSPECTION INVENTORY. The worksheet is used as per instructions to make a record of the inspection keypoints for each inspection area. See text for further explanation.

be inspected. For example, the parts of an extension ladder that should be inspected regularly are the side rails, rungs, safety shoes, rope, and rung clamps. Identify those parts that are likely to develop unsafe conditions or likely to result in serious consequences if they do develop unsafe conditions.

Complete Step 3 by alternating back and forth between Steps 3 and 4. For example, record a critical part and then describe the unsafe conditions for which the part should be inspected. If it takes more than one line to describe the unsafe condition, record the next critical part (in column 2) in line with the space for describing its potential unsafe conditions.

4. *Describing conditions to inspect for.* Whenever possible, use one or two key words to describe the unsafe conditions for which an item or part thereof should be checked. However, if more description is necessary, give it. Below are some common key word descriptions:

sharp-edged	vibrating	littered
jagged	leaking	excessive
splintery	loose	spalled
crooked	missing	insufficient
broken	inoperative	gaseous
mutilated	deficient	rotted
worn	unstable	protruding
frayed	slipping	malfunction
deteriorated	decomposed	spillage
corroded	defective	noise

5. *Describing how often to inspect.* Decide a reasonable frequency for inspecting each item or parts thereof. If two persons are to do the inspecting independently, establish the frequency for each. For example, a crane operator may be required to inspect hoisting cables daily whereas a crane inspector may be required to inspect them less frequently.

Use code abbreviations to indicate the frequency of inspection. Below are some useful code abbreviations. Develop others as needed.

C - continuously	D - daily
H - hourly	W - weekly
BU - before using	M - monthly
WI - when issued	Q - quarterly
WR - when returned	SY - semi-yearly
WS - when serviced	Y - yearly

6. *Decide who should inspect.* Most items that do not require specialized knowledge of apparatus should be inspected by (1) the user or operator and (2) the area supervisor unless special personnel have been assigned to inspect them. Use the following abbreviations to indicate who should inspect: U-user, O-Operator, and AS-area supervisor. Other useful abbreviations are: CI-crane inspector, FI-fire inspector, MM-mechanical maintenance, EM-electrical maintenance, BI-boiler inspector, SP-safety personnel, and MI-motor inspector. Develop others as needed. When two persons are to do the inspecting, indicate so.

SOURCES FOR IDEAS

When you do such an inventory, you will rely mainly on your knowledge and past experience to develop the answers. Other sources of ideas include equipment operators, other supervisors, safety personnel, and manufacturer equipment manuals.

USES FOR THE COMPLETED INSPECTION INVENTORY

The completed safety inspection inventory is useful primarily as a record of the inspection requirements for the area to which it applies. In addition, it can be used to:

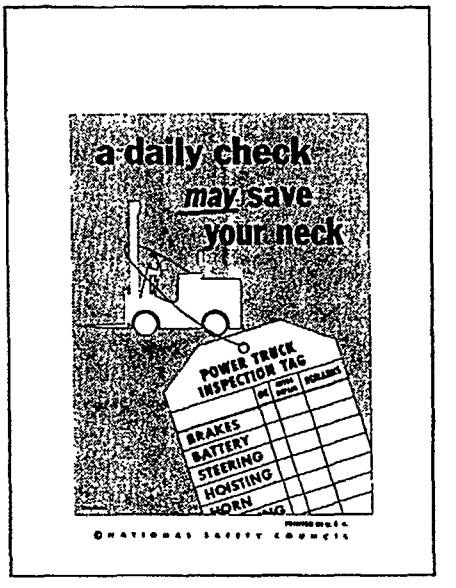
1. Assign inspection responsibilities to non-supervisory employees.
2. Train new supervisors in their inspection responsibilities.
3. Assign inspection responsibilities to inspection specialists.
4. Plan preventive maintenance activities.
5. Develop inspection guide checklists.

The latter use will be discussed fully in the next section.

CHECK YOURSELF ON THESE QUESTIONS

1. Why should safety inspections be organized on a regular systematic basis?
2. What is incidental inspection? What is planned inspection? Are both kinds necessary?
3. What is a safety inspection inventory?
4. Why is it desirable to define inspection areas exactly?
5. What is the advantage in posting graphically defined areas of inspection responsibility?
6. What are some general categories of items that usually require regular inspection?
7. What kinds of equipment or machinery parts usually require regular inspection?
8. What determines how often anything should be inspected?
9. What determines who should inspect a given item?
10. Why is it desirable to use a standardized form for recording a safety inspection inventory?
11. What are some sources that are helpful to consult when doing a safety inspection inventory?
12. Of what use is a safety inspection inventory when it is done?





Conducting Planned Safety Inspections

DEVELOPING INSPECTION GUIDE CHECKLISTS

THE ADVANTAGES OF USING TAILORED INSPECTION CHECKLISTS

When a first-line supervisor has an area that contains many items requiring regular inspection by him, his inspection activities should be guided by an inspection checklist. Ideally, the inspection check list should be tailored to his assigned area of inspection responsibility. It should identify the specific facilities and items of equipment that he is expected to inspect. Moreover, the checklist should identify the major parts of equipment that should be inspected.

Properly designed, the area inspection checklist has many advantages. First, it clarifies inspection responsibility. The supervisor knows the specific items he is required to inspect. He is not left in doubt about his inspection responsibilities.

Second, the checklist makes it less likely that items will be overlooked. When an item is inspected, that fact is recorded on the checklist. The supervisor can quickly tell at any time what items he has inspected in the current inspection period, and what items remain to be inspected.

Third, the checklist provides a basis for reporting inspection activities and findings. At the end of the monthly inspection period, it can be turned in to higher supervision to indicate completion of inspection assignments.

Fourth, the checklist provides a basis for higher supervision to control inspection activities. A glance at the area inspection checklist at any time will indicate whether or not inspections are being made. If necessary, recently inspected items can be rechecked to establish their condition.

Lastly, a checklist can save writing detailed inspection reports. The type of checklist proposed for use in Armco plants does exactly that!

ARMCO SAFETY INSPECTION CHECKLIST

DEPT. Processing	AREA	No. 1
FORE. John Jones	PERIOD	July
	(3)	(3)
MATERIAL HANDLING EQUIPT.		
Boom Tractor		0-7-4-64
controls		
chain		
horn		R
tires		
lights		
O.H. Boom Crane		0-7-6-64
cable		
c-hook		
controls		
brakes		
trolley assembly		
PRODUCTION EQUIPMENT		
Norton Grinder		0-7-8-64
grinder wheel		
v-belt		R
controls		
electric switches		
Chrome Plater		0-7-[illegible]-64
tanks		C
tank connect		R
roll anodes		
tank cont		
exhaust		
bus		
115 Mill		
wipers		
guide assembly		
switches		
pay off re		
hydroge		
spindl		
take		

FIG. 3. INSPECTION GUIDE CHECKLIST. The overlay, on which the items to be inspected are typed, is shown in position on the underlay, on which inspection dates and findings are recorded. Notice how simple it is to record what items have been inspected.

The above advantages of inspection checklists add up to a better job of planned safety inspection. There will be less unnecessary duplication of inspection work. *It is therefore recommended that all Armco supervisors, who are assigned areas to inspect on a regular basis, use the type of inspection checklist* shown in Figure 3, or some equivalent checklist designed for their area.

A RECOMMENDED TYPE OF AREA INSPECTION CHECKLIST

The best checklist is one that identifies by names the specific facilities and equipment, and their major parts, that require inspection in any given area. Figure 3 shows one version of this type of checklist. It is designed to be housed in a pocketsize loose-leaf binder. The checklist consists of two units, an overlay which lists the items to be inspected and an underlay on which inspection dates and inspection findings are recorded. The heavy line on the record shown in Figure 3 indicates the border of the overlay. The area above and also to the right of the heavy line is the exposed portion of the underlay. The bottom right-hand corner of the underlay is shown torn away to reveal how it has been positioned over the underlay.

Figure 4 shows the overlay removed to reveal the full underlay. Notice, how it has been used to jot down inspection dates and findings.

Once prepared, the overlay is permanent. It is not discarded or turned in after the items have been inspected. All inspection dates, findings, and notes about corrective actions either taken or planned are recorded on the underlay. It is the underlay that is turned in at the end of the inspection period, usually the end of the month. A fresh underlay is used for each inspection period.

Some prefer to list the items to be inspected on the *underside* of the overlay. The overlay is then flipped open so the list of items is exposed in line with the full underlay. Use whichever method appears most practical.

Now that you have an idea of the physical arrangement of the perpetual inspection checklist, let's discuss how the overlays are prepared from a completed safety inspection inventory.

PREPARING THE CHECKLIST OVERLAY

The checklist overlay is prepared from the information contained on the safety inspection inventory worksheet. Only those items and item parts that have been designated the inspection responsibility of the area supervisor are transferred to the overlay. Thus, an item that is to be inspected by a crane inspector only would not appear on an area supervisor's overlay.

The items and their parts are transferred from the inventory worksheet to the overlays in groups according to the recommended frequency of inspection, e.g. items for which daily inspection by the area supervisor is recommended are grouped together on separate overlays, items for which weekly inspection by the area supervisor is recommended are grouped together on separate overlays, and so on. This can be done by developing one "frequency of inspection" grouping at a time from the inventory worksheet. The

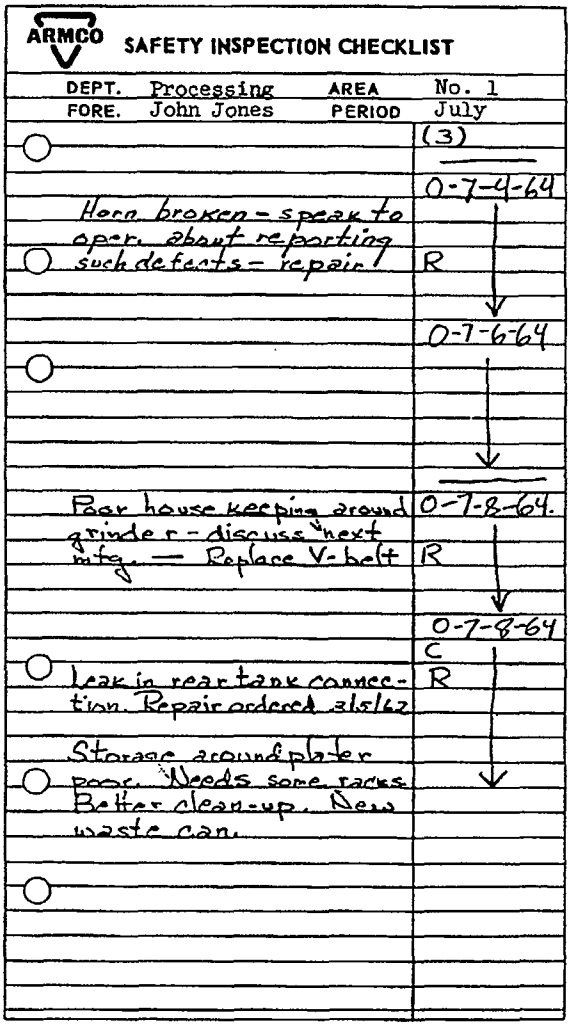


FIG. 4. INSPECTION RECORDING UNDERLAY. The overlay has been removed to reveal the full underlay. New underlays are used for each inspection cycle.

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arrangement of information on the overlays should follow the pattern below.

(PRINCIPLE)	(EXAMPLE)
INSPECTION CATEGORY	MATERIAL HANDLING EQUIPT.
Item	O.H. Travelling Crane
part	hoisting chains
part	brakes
Item	Forklift Truck

If a part of an item requires daily inspection and another part requires monthly inspection, the item should appear twice, once on a daily overlay and once on a monthly overlay. In each case, however, the part listed beneath the item will be different.

For some items, the parts that require inspection may be of such common knowledge that it is unnecessary to list them. For example, the two critical parts of a hammer are the "head" and the "handle". Do you think it would be necessary to list the parts for such an item?

It is advisable to leave a minimum of two blank spaces after the critical parts listed for each major item of equipment. This will permit adding critical parts to the list, should that be necessary, without redoing the overlays. It is a simple matter to type new items on the overlays.

The number of overlays necessary for a given area supervisor will depend, of course, upon how many items require regular inspection by him. This, in turn, will depend upon the nature and size of his assigned area. As few as six overlays may be sufficient for some areas.

FOREMAN USE OF INSPECTION CHECKLISTS

Ideally, you should coordinate your planned inspection work with your other responsibilities to reduce to a minimum time spent on inspections. For example, plan to inspect items at a given location in your area when other duties take you there. Avoid making special trips to inspect unless that is the only way the items get inspected. Such coordination is all the more important if your inspection area is very large.

USING DAILY CHECKLISTS

Items requiring daily inspection are best checked as soon after the start of the turn as possible. That way, you will spot any unsafe condition left over from the previous turn before it has a chance to tag one of your men with an accident.

No underlay is advised for use with the list of items requiring daily inspection. The paperwork is excessive for the control advantage gained. It is sufficient that the items requiring daily inspection are listed, so foremen know what they are. If higher supervision wants to know whether or not the daily items have been inspected, the best control is a personal spot check.

USING WEEKLY CHECKLISTS

Items requiring inspection at least once a week should be inspected at the supervisor's convenience. Usually there is some time during the week when other duties are not so pressing.

Some foremen prefer to inspect such items at one time at the beginning or end of the week. If there are many such items, it may be best to spread their inspection over the entire week, catching a few on one day, a few more on another day, and so on.

The underlay should be used for the weekly item checklist. Usually, there are not so many of such items, and a single underlay will take care of all. The inspection record is handed in to the next highest level of supervision unless the department has made other arrangements.

USING THE MONTHLY CHECKLISTS

Probably the majority of items requiring regular inspection by an area supervisor will be on the monthly checklist. If there are many such items, the best inspection approach is to spread the inspection over the entire month period rather than to attempt to inspect all items in one con-

centrated effort. The inspections of individual items can then be coordinated with other activities, e.g. inspect an item when other duties take you in the vicinity of the item. However, such details are best decided by you. You may prefer to concentrate your inspection of "once a month" items in a single day.

RECORDING ON THE UNDERLAYS

When an item is inspected and found to be satisfactory, record "O" (for OK) and the date next to the item on the underlay as shown in Fig. 4. That will give you a record verifying that the item was inspected and found to be in a safe condition.

When an item is inspected and found to be unsafe, usually one of three corrective actions are called for: (1) It requires a safer *arrangement.* (2) It requires *repair or replacement.* (3) It requires *maintenance service such as lubrication.* (4) It requires *cleaning or cleanup.* To record what it does require, use the abbreviations as follows:

A - Safer arrangement
R - Repair or replacement
M - Maintenance service
C - Cleaning or clean-up

The abbreviations are easy to remember. Together with the O for OK, they spell ARMCO. Record the date behind the appropriate letter symbol. Use the area underneath the overlay, and also the reverse side of the underlay to make any inspection notes. You may want to record details of findings in some instances. Or, you may want to jot down an idea related to correcting unsafe conditions found. Or, you may want to jot down a reminder of some kind.

When an item which involves checking many parts is inspected on a given day, it is not necessary to record a date entry on the underlay adjacent to each part. The date may be recorded opposite the item title, and a line may be drawn down to and including the last part inspected, provided all intervening parts have been inspected also. The principle is illustrated in Fig. 4.

CHECKLIST USE BY OTHER PERSONNEL #145

The area inspection checklists are intended primarily for the use of first-line supervisors who have been assigned specific sub-areas of a department. However, effective use of such checklists can also be made by other personnel.

1. ***Department Superintendent Inspections.*** Normally, inspections by department superintendents are of the general housekeeping kind. The use of area inspection checklists tends to sharpen up such inspections. Also, foremen are more stimulated to keep their assigned areas in order if they know their areas will be spot checked by higher supervision *using their own inspection checklists.*

2. ***Departmental Audit Teams.*** When departments are audited by management personnel from other departments, an inspection is usually part of the auditing procedure. Such inspection audits will be more thorough if the auditing team makes use of the *area inspection checklists.*

3. ***Safety Department Inspections.*** Plant safety personnel are advised to conduct planned inspections of departments. By using the *area inspection checklists* as a guide, such personnel can program their inspection activities around assigned areas. They will also be able to advise what items should be added to area inspection checklists.

The checklists can also be used by employee representative inspection committees. They are not recommended for (1) works or plant manager inspections, (2) interplant inspection teams, or (3) inter-divisional inspection teams because of their detail.

GENERAL HOUSEKEEPING STANDARDS

Good housekeeping goes hand in hand with safety and efficiency. It is a combination of *orderliness* and *cleanliness.* To promote orderliness, see to it that (1) all things have an assigned place for storage, (2) all things are kept in their assigned place when not in use, and (3) all things are stored in their assigned places in the manner that they should be. To promote cleanliness, see to it that (1) the sources of *avoidable* uncleanliness are corrected, and (2)

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the unavoidable conditions are regularly cleaned up. Admittedly, these things are easier said than done, but they can be done and must be done to maintain good housekeeping.

You may find the housekeeping standards given below a useful guide for your own area of supervision.

WALKWAYS AND STAIRS

1. *Walkways.* Where it is the practice to mark walkways with yellow guide lines, keep the yellow lines distinctly painted. Allow no objects to protrude into walkways. Keep walkways clear of stored materials, tools, and equipment.

Keep walkways free of tripping hazards, e.g. debris, scrap, cables, hoses, rope, chains, etc. Keep walkways free of slipping hazards, e.g. oil, grease, water, papers, granular materials, etc. Do not allow mobile equipment to block walkways.

2. *Stairs.* Store nothing on stairs. Keep stairs clear and dry, free of tripping and slipping hazards. Remove promptly accumulations of oil or grease.

Keep access to or from stairs free from stored materials or mobile equipment. Pay particular attention to slipping and tripping hazards in the area at the top of stairs. Keep handrailings reasonably clean so they will be used.

GENERAL STORAGE FACILITIES

1. *Material and equipment racks.* Keep materials and equipment racked in an orderly manner. Store on racks only materials and equipment intended for the racks. Keep floor areas under racks clear of storage, and free of debris, refuse, scrap and other foreign matter.

2. *Supply bins.* Keep materials in bins in an orderly manner. Allow no materials to hang out over edges of bins. Police bins to keep them free of waste, discarded wrappings, empty boxes. Allow no storage of flammables in supply bins.

3. *Yard and floor storage areas.* Define yard and floor storage areas with distinctive markings or signs. Plan what goes where in such defined areas. Maintain storage according to plan.

Store materials in orderly rows and stacks to permit easy identification and access. Do not store materials haphazardly one on another. Maintain walkways.

Keep yard and floor storage areas free of debris, scrap, refuse, garbage and other foreign matter. Keep stored materials within defined boundaries of storage areas.

Do not store flammables, explosives, or gas cylinders in general storage areas where combustible materials are stored.

TOOLS AND PORTABLE EQUIPMENT

Establish a safe and convenient storage location for tools and portable equipment used regularly in your area. Provide the necessary storage facility, e.g. racks, bins, shelves, hooks, etc.

Keep tools and portable equipment stored in proper places when not in use. Do not allow them to be haphazardly dropped on the floor of working areas.

Keep tools and equipment reasonably clean of oil, grease, dirt, and other accumulations that may render them hazardous to use.

FIREFIGHTING AND FIRST AID EQUIPMENT

Identify the locations of firefighting, rescue, and first-aid equipment with signs and distinctive backgrounds. Maintain proper access to such equipment. Do not store materials, tools, and other objects in, on, or around firefighting, rescue, or first-aid equipment. Don't allow mobile equipment to be parked in front of such emergency equipment.

SHOP AND OTHER WORKING AREAS

1. *Floors.* Keep floor areas free of tripping hazards, e.g. scrap, cables, hoses, operating supplies, spare parts, etc. Also, free of slipping hazards, e.g. oil, grease, water, paper, bottles, etc. Working areas should be swept clean at regular intervals.

2. *Workbenches.* Workbench tops should not be used for storage purposes. Benches should be swept clean after work, and unneeded materials and tools should be re-

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moved. Storage in workbench drawers and cupboards should be kept orderly, and free of waste and rubbish. The floor areas under work benches should be free of storage, and kept swept clean.

3. *Tools and equipment.* Keep tools and small equipment stored in assigned place when not in use. During the completion of a job, tools and equipment should be positioned so they do not cause tripping hazards. After job completion, the area should be cleaned up and things returned to proper storage.

4. *Operating supplies and working materials.* Store operating supplies that are used regularly in an orderly manner, and so they do not interfere with traffic. Have spills cleaned up promptly. Avoid spills by having the right kind of recepticle for such supplies. All working materials should have a planned place of storage. After job completion, usable materials should be returned to their proper place of storage.

Scrap materials should be cleaned up and deposited in scrap receptacles or scrap piles.

WASTE, SCRAP, AND REFUSE CONTAINERS

Provide standardized waste, scrap and refuse containers as needed. Decide the strategic places to locate such containers. Where practical, mark the floor area where such containers are to be positioned to help in keeping them where they should be.

Containers for different materials should be painted differently if a separation is wanted. Containers should not be filled to overflowing before being emptied. A prominent sign above containers is helpful to direct attention to them.

PRODUCTION AND SERVICE EQUIPMENT

1. *Areas adjacent to equipment.* Keep areas around and under production equipment free of debris, scrap, dirt, excessive oil and grease, combustible wastes, and other unsightly or hazardous accumulations.

If tools and supplies must be stored close to such equipment, establish an orderly plan of storage. Storage should not interfere with access to vital parts of the production equipment. Do not store flammables or combustibles around machinery. Use oil absorber on floor areas where needed.

2. *Equipment.* Keep production and service equipment reasonably clean of excessive oil, grease, and grime. Don't allow materials to be left in equipment after a job has been done. Enforce operator clean-up responsibilities.

Allow no storage on production or service equipment. Pay particular attention that storage does not block access to valves and switches. Where it is the practice, order steam-cleaning of equipment when necessary to restore appearance. Maintain decorative painting of equipment whenever practical.

WALLS, CORNERS, COLUMNS, WINDOWS, ETC.

1. *Walls.* Keep walls free of unsightly accumulations of oil, grease, and other splashed material. Do not permit employees to deface walls in any way or to post unauthorized signs, posters, etc.

Do not use wall areas as a catch all for storing miscellaneous parts and equipment. If wall areas must be used for storage provide adequate racks, shelves, or bins. Do not store things by merely leaning up against a wall. Provide the needed storage facility.

2. *Building corners.* Do not allow corners to become a catch-all for miscellaneous storage. Unless corners are equipped with an adequate storage facility, e.g. shelves, racks, etc., they are best left clear. Where it is the practice, keep corners brightly painted to discourage their use as disposals.

3. *Building columns.* Do not use the bases of building columns as storage places. Do not store tools and materials by leaning against building columns. Where it is the practice, keep the bases of building columns brightly painted to discourage their use as disposals.

4. *Windows.* Do not block windows. Doing so cuts down illumination and ventilation. Keep window sills free of all storage. Request that windows be cleaned when they become unreasonably dirty. Do not permit materials and equipment to be stored leaning on windows. Report broken windows for prompt replacement.

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MISCELLANEOUS

1. *Locker room facilities.* Keep locker tops free from all storage. Do not allow wire clothes hangers or wire hooks to hang on the outside of locker doors. Locker room facilities should be kept clean and well ventilated.

2. *Artificial light sources.* Reflectors should be kept reasonably clean. Burned out light sources should be replaced promptly. Unauthorized or improvised shades are not permissable.

3. *Roadways.* Roadways should be kept free of debris, rubbish, scrap and other unsightly accumulations. Do not allow stored materials to encroach on roadways. Roadway signs should be kept legible by cleaning, repainting or replacing.

4. *Railroad track areas.* Railroad track areas should be kept free of debris, rubbish, scrap, and other unsightly or hazardous accumulations. Required clearances should be maintained.

5. *Rubbish or scrap piles.* Where it is necessary to accumulate rubbish, scrap, etc. in floor piles instead of containers, keep the piles confined to a specific small area. Do not let them spread unnecessarily. Keep them free of extraneous materials that should not be stored with the material to be piled. Get rid of such piles as soon as practical.

6. *Signs and posters.* Keep permanent signs clean and firmly fixed in place. Remove torn defaced, or dated posters.

7. *Automatic canteens.* Provide an adequate disposal next to such machines. Keep empty bottles in racks provided for that purpose. Keep adjacent area swept clean of wrappings, cups, bottle caps, etc. Make a vigorous effort to get employee cooperation on keeping areas around vending equipment clean. Persistent non-cooperation should be good cause for considering the advisability of removing such equipment.

TAKING STEPS TO CORRECT UNSAFE CONDITIONS

A first-line supervisor's responsibility for correcting unsafe conditions was described in Section 9, Chapter 3. It is appropriate to restate these responsibilities because they are so closely related to planned safety inspections. When confronted with an unsafe condition, act as follows:

1. *Order correction when you have the authority to do so.* Don't delay. If you do, you run the risk of an accident or of forgetting about the unsafe condition. Always follow through as necessary until the condition has been corrected.

2. *Correct source causes when you have the authority to do so.* Always evaluate the unsafe condition in terms of what caused it. Get at the root of a repetitive unsafe condition. Take whatever corrective actions your authority permits to eliminate or correct the cause of the unsafe condition.

3. *Report unsafe conditions beyond your authority to correct.* Report them promptly to higher supervision. Don't just tell; try to sell higher supervision on the need to correct the condition. Give the full facts, and be ready to recommend some specific solutions to correct the condition.

4. *Report source causes beyond your authority to correct.* If the cause or source of an unsafe condition is beyond your authority to correct, report the facts to higher supervision. Don't merely correct the immediate unsafe condition and leave the source cause free to operate again because it is beyond your authority. For example, if a member of another department is creating housekeeping problems in your production area, discuss the matter with higher supervision if you get no cooperation from the other department.

5. *Take temporary precautions as needed.* There is often delay between the time a condition is ordered corrected and when it is finally corrected. Take whatever temporary precautions are necessary to protect your men until the final correction is made. Such precautions may include warning all men, posting hazard signs, roping off the area, and even shutting down equipment.

6. *Follow-up the condition.* Where you have ordered an unsafe condition corrected or reported an unsafe condition to higher supervision, be sure to follow-up. It usually takes a follow-up check to ensure that the condition gets correction

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SAFETY INSPECTIONS BY OTHER PERSONNEL

The emphasis of this section has been on foremen safety inspections. Foremen, however, are not the only ones who should be conducting planned safety inspections. Others who should also be inspecting for unsafe conditions include:

1. *Inspection specialists.*
2. *Safety personnel.*
3. *Department Heads.*
4. *Works and Plant Managers.*
5. *Non-supervisory employees.*

INSPECTION SPECIALISTS

The inspection work of specialists, such as crane inspectors, vehicle inspectors, motor inspectors, etc. should be based on the same principles discussed earlier. Their inspection activities should be guided by the use of checklists developed on the basis of a careful analysis of what requires inspection. Their inspections should be controlled by requiring inspection records to be turned in to responsible supervisors. Now and then, their reported inspections should be double-checked to ensure the validity of their reports.

SAFETY PERSONNEL

Full-time plant safety personnel should have a definite planned safety inspection program to follow. Where there are several such personnel for a plant, each should have a definite inspection area. Their inspection areas should be drawn up so all parts of the plant fall into one or another area. Departments that fall within such areas should be inspected regularly by the responsible safety personnel. Inspections should be guided by checklists developed for the purpose, and inspection findings should be reported to the appropriate department heads.

Many safety personnel practice tour-taking inspections of the keep-your-eye-open kind. Such inspections are effective to a degree, but they are no substiture for a systematic, checklist-guided inspection.

DEPARTMENT HEADS

Aside from their informal inspections on trips through their departmental areas, department heads should conduct a planned inspection of some area of their department each month. It should be a thorough inspection which makes use of the area checklists used by first-line supervisors. It is not necessary that the department head attempt to cover all items on such checklists. The inspection can be confined to selected items related to housekeeping and general safety, e.g. walkways, yard areas, storage facilities, and machine guards.

The department head should be accompanied by the supervisor whose area is being inspected, and by that supervisor's immediate supervisor. Unsatisfactory conditions should be recorded as the inspection procedures. The responsible supervisor should be required to re-submit the list to the department head as soon as all items are corrected.

Ideally, the inspection should precede the monthly departmental safety meeting with supervision. That will give the department head an opportunity to point out his findings for the benefit of all supervision.

WORKS AND PLANT MANAGERS

Works and plant managers should also plan inspections, preferably one each month. A different department should be selected each month. Whether announced in advance or unannounced, such inspections let all levels of plant management know that the top man has a personal interest in plant housekeeping and conditions of facilities and storage. A morning or afternoon spent in such activity once a month may tell the manager more about his plant's safety program than a dozen reports.

The manager should be accompanied by the plant safety engineer, the head of the department being inspected, and area supervisors. Unsatisfactory items should be recorded. The resulting list may be left with the department head with the understanding that corrections will be reported when completed. It is also effective if the manager describes his inspection findings at his monthly safety meeting for the benefit of other department heads. A properly placed needle has considerable therapeutic value.

NON-SUPERVISORY EMPLOYEES

Employees who operate machinery and equipment or who work in a fixed area should be made responsible for keeping their areas of work orderly and clean. They should be instructed so

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they know exactly what their work station clean-up and inspection responsibilities are. Where considerable inspection work is a regular part of their job duties, the use of an inspection checklist should be considered.

It is the first-line supervisor's responsibility to see to it that his men carry out their clean-up and inspection responsibilities. His best line of action is persistent spot-checking of his own. Indications of inspection or clean-up failure should be discussed tactfully with responsible employees. Education and friendly persuasion usually do more good than displays of irritation. Even so, it may be necessary to act more forcefully with unresponsive men.

* * * * * * * * * * * * *

The use of inspection guide checklists has been emphasized heavily. One thing further needs to be said about such checklists. They are tools. Like any tool, they can be effective or ineffective, depending upon the users. Where they have been tried and found wanting, the fault lies less with the checklists than with how they were *used and controlled.*

CHECK YOURSELF ON THESE QUESTIONS

1. How does the area inspection checklist work?
2. How is the information from the inspection inventory organized on the inspection guide overlay?
3. Why are inspection items grouped together on the inspection guide overlay according to recommended frequency of inspection?
4. Is it always necessary to list on the overlay the parts of an item to be inspected? Explain.
5. How many overlays does it take for each inspection area?
6. When is it best to check items requiring daily inspection?
7. Explain what is recorded on the inspection guide underlays. How?
8. What are the advantages of using inspection guide checklists?
9. What generally must be done to promote good plant housekeeping?
10. Explain the alternatives of action that a supervisor has when he is confronted with an unsafe condition.
11. Why is it important that supervision follow-up on conditions reported for connection to higher supervision or to maintenance personnel.
12. Should plant safety personnel conduct a final plant inspection of their own? Reason?
13. Should a department head conduct a final departmental inspection each month? Reason?
14. Should work or plant managers conduct a final inspection of some part of the plant each month? Reason?

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Managing a Safety Inspection Program

THE PLANNED SAFETY INSPECTION PROGRAM

A planned safety inspection program is based on the idea that each foreman has an assigned area for which he will assume responsibility for regular, planned inspections. Each foreman so assigned must know what he is to inspect, the conditions he is to inspect for, and the frequency for inspecting different items. His inspection should be guided by a checklist, and his inspection activities should be recorded so that they are subject to control.

Such an inspection program is a much different one from the casual kind of inspecting that most foremen do as they make their rounds. It is systematic. It will do a much better job of detecting unsafe conditions than an informal "keep your eyes open" inspection program. However, it must be correctly installed and managed in order to achieve the potential benefits. Again, the department superintendent is the key man. He must assume an active role in the installation and management of the program.

What follows is a guide for department superintendents in how to install and manage this type of safety inspection program.

PLANNING AND ORGANIZING A SAFETY INSPECTION PROGRAM

Before your supervisors are ready for conducting planned inspections, considerable preliminary work must be done. The basic steps are as follows:

1. *Define and assign inspection areas.*
2. *Make inspection inventory assignments.*
3. *Check inspection inventory progress.*
4. *Review and approve inspection inventories.*
5. *Develop area inspection checklists.*

Let's discuss each in some detail.

DEFINING AND ASSIGNING INSPECTION AREAS

The details of this initial step are described in Section 19. You are advised to discuss the definition of assigned inspection areas with your supervisors. Work out the definition of areas with them instead of confronting them with a final arrangement. Or, you may wish to discuss with them a preliminary division of the department into assigned inspection areas. Don't hesitate to modify the preliminary division if there are reasonable objections.

Demarcate the assigned inspection areas on a floor plan of the department. The preliminary division of the department into assigned inspection areas should be checked out by visiting the areas. Boundaries that look good on a floor plan may need revision after the area has been visited. When visiting the area, also try to assess the magnitude of inspection work that will be involved. The assigned areas need not be equal in floor space. Indeed, there may be good reasons why they should *not* be equal. Other things equal, the definition of areas should take into account the amount of inspection work that will be involved and the natural boundaries indicated by where one process begins and another ends. Sometimes however, it may be necessary to draw arbitrary lines of division.

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Once the supervisors have agreed to the preliminary definition of areas, draw up in final form a floor plan that shows clearly the different areas. The areas can be either color-coded or number-coded for easy identification. The names of supervisors should be keyed to the areas designated on the floor plan. Each supervisor should know his assigned area.

It is a good idea to wall-mount the floor plan in some convenient location. Consider the possibility of posting supervisor names in their assigned areas. A sign might read, "Housekeeping in this area is the responsibility of John Doe". It is known that supervisors will take more pride in an assigned area that has been marked with their name. The sign should be designed for easy replacement.

MAKING INSPECTION INVENTORY ASSIGNMENTS

The details of how to do an inspection inventory of an assigned area are discussed in Section 19. Each foreman or supervisor should be assigned to establish the planned inspection requirements of his own area. An alternative is to have each area analyzed by two first-line supervisors, one of which will be assigned to the area. The two supervisors can help each other. Thus, after foreman A has helped foreman B inventory his area, the latter in turn will help foreman A inventory the inspection requirements of his area. This alternative does slow down the process of establishing the inspection requirements, but it also results in a more thorough inspection inventory. It also permits pairing a foreman who is more capable at this type of work with one who can be expected to have some difficulty with a paper and pencil analysis.

There is no way to say how long it should take to complete the inspection inventory for a given area. That depends upon the size of the area, the operations and facilities in the area, and how much time the supervisors have to devote to the analysis each week. Thus, it is difficult to set a realistic target date for completion. Nevertheless, an average reasonable pace is at the rate of one inspection category per week. There are 20 inspection categories on the inventory work sheet. At one per week, that means twenty weeks. Of course, not all 20 inspection categories necessarily apply to all areas. One category, for example, is "elevators, escalators, and manlifts". Few foremen will have such equipment in their assigned areas.

Be advised against trying to have the inspection inventory completed in a hurry. Let your foreman know you want an accurate and reasonable analysis of area inspection requirements. Allow plenty of time, but insist on steady progress.

MAKING FREQUENT PROGRESS CHECKS

Assign to general foremen or other higher level supervisors the responsibility for checking the progress made by their first-line supervisors. They should check to make certain that (1) target dates are being met, (2) inspection items are being correctly identified, (3) critical parts are being correctly identified, (4) the conditions to be inspected for are satisfactorily described, and (5) the recommended inspection frequencies are reasonable. Checking these items early in the game will avoid redoing analyses later because of misunderstandings. It is foolish to let a foreman complete the inspection inventory for his area before reviewing his work. He may spend several months on the wrong track. The time to get him on the right track is as soon as he has done enough of the analysis to evaluate the results. His work should be checked *after the completion of each inspection category.*

Don't rely wholly on general supervisors to check the quality of the area inspection inventories. Check a few each month yourself. Satisfy yourself that the analyses are being done correctly. Use a regular safety meeting to give your impressions of the analyses that you have sampled. Your supervisors will be impressed that you are taking a personal interest in the work.

Establish some type of control so you know what progress has been made at the end of each month. Here is a simple measure of progress. Let's say you have 10 supervisors with an assigned area to analyze, and each has 20 (unlikely) inspection categories to complete. That makes a total of 200 inspection categories to be analyzed. If at the end of the first month, 20 inspection categories are reported completed, the inventory is 10% complete for the department. In this way you can get a report each month of what percent of the total inventory task has been completed to date. Feel free to develop a more suitable method for keeping informed on progress made each month. Act promptly if there are indications that progress is lagging.

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REVIEWING AND APPROVING INVENTORIES

Assign to general foremen or other above first-line supervisors the responsibility for reviewing and approving the area inspection inventories. Request that they review and approve each inspection category as it is completed rather than wait until an entire area inventory has been completed. That makes review and approval less of a chore. It also catches weaknesses and misunderstandings before they have been compounded throughout an entire area inventory.

When inventories indicate the need for inspection by personnel from other departments, e.g. electrical maintenance inspectors, crane inspectors, etc., an effort should be made to contact other departments to establish mutual agreement on what items should be inspected by their personnel. Once such agreement is established, the details of parts, unsafe conditions and frequency of inspection should be determined by the responsible department.

You may also wish to have the plant safety department review some of the completed area inventories. This is particularly desirable if your department is included in the plant area assigned to a plant safety inspector. The valuable experience of these men should not go untapped.

DEVELOPING AREA INSPECTION CHECKLISTS

The details of how to develop an area inspection checklist from the area inspection inventory are discussed in Section 20. While the procedure is not difficult, it is *not* advisable to have your foremen prepare their own checklists. A better procedure is to have one or two persons who are especially capable with paper and pencil prepare drafts of the area checklists for typing. Each draft should be checked with the appropriate foreman before it is converted to a typed overlay. Two sets of overlays should be prepared for each assigned area, one set to go to the foreman assigned to the area and the other to go to his general supervisor. The plant will provide the necessary pocket-sized binder and underlays.

Once prepared a set of typed underlays should be good for several years. Items can be added or deleted from time to time as necessary without redoing the entire set of underlays. Supervisors should be cautioned not to mutilate or deface the typed overlays. It is desirable to rotate supervisors so each has a different assigned area every year or half-year. Clean overlays can be passed from one supervisor to another.

LEADING & CONTROLLING A SAFETY INSPECTION PROGRAM

All the preparation work will come to nothing if the safety inspection program is not properly lead and controlled. The basic steps for leading and controlling the program are as follows:

1. *Communicate what is expected.*
2. *Control by checking inspection records.*
3. *Control by double checking checklist items.*
4. *Conduct personal planned inspections.*
5. *Order prompt corrective actions.*
6. *Keep a log of deferred items.*
7. *Publicize corrected unsafe conditions.*
8. *Be a stickler on housekeeping.*

Let's discuss each in some detail.

COMMUNICATING WHAT IS EXPECTED

When all foremen have been given the inspection checklists for their areas, a safety meeting should be devoted to letting them know the mechanics of the safety inspection program, and what is expected of them.

The following points should be covered: (1) How they are expected to use the checklists. (2) To whom the checklist underlays should be turned over to at the end of each month. (3) How their inspection activities will be checked by higher supervision. (4) Why they are to report unsafe conditions promptly instead of waiting until the end of the month. (5) The housekeeping standards they are expected to maintain in their assigned area. (6) What their responsibilities are outside of their assigned areas.

Make it a point to impress the supervisors that they will be held accountable for poor housekeeping in their assigned areas.

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CONTROLLING BY CHECKING SAFETY INSPECTION RECORDS

General foremen or others who directly supervise the foremen with assigned inspection areas should check the inspection records maintained by the latter. At the end of each month, the foremen should turn in their checklist underlays to their immediate superior. The records should be checked to see that all items were inspected. It takes but a few moments to make such a check. If the overlays have been properly completed, any blank space in the right hand column of an underlay indicates an item has not been inspected or the record of inspection was not made. Many blank spaces indicate a problem that should be checked into. Similarly, if a foreman turns in records with many blank spaces, month after month there is clearly a problem. It is up to the general foremen to take necessary corrective actions. A wise superintendent will now and then check a few records himself.

Records should also be spot-checked during the month. That will discourage the occasional supervisor from waiting until the end of the month before making the required planned inspections. Once supervisors are convinced their inspection records are likely to be checked during and at the end of the month, they will be more inclined to inspect as required.

CONTROLLING BY DOUBLE CHECKING SELECTED ITEMS ON CHECKLIST

Now and then, general foremen should select items that the records indicate have been inspected on the same or previous day, and inspect those items. If a given item is in a satisfactory condition, it is reasonable to assume it was inspected. If the item is in an unsafe condition, it may be that the supervisor needs to be reinstructed on the standard of what is unsatisfactory. If there are repeated discrepancies with a particular foreman, it may be that inspections are being reported that, in fact, were not made. The benefit of doubt should always be given to the supervisor.

It is neither necessary nor desirable to double-check items frequently. Occasional double-checking should suffice. The primary purpose of of this type of double-checking is to clarify differences of opinion about what is safe and unsafe. It is surprising how often two supervisors may disagree, for example, on whether a housekeep ng condition is satisfactory.

CONDUCTING PERSONAL INSPECTIONS

Few things will motivate supervisors more to do a good job of safety inspection than the knowledge that their department head will inspect their assigned areas with a critical eye. This is the superintendents opportunity to lead by example and to set the standards for his department. A superintendent who is tolerant of poor housekeeping is merely educating his supervisors to be the same. The reverse is also true. Lean toward a demanding standard of housekeeping, and your supervisors will lean in that direction too. Don't hesitate to show dissatisfaction where the situation calls for dissatisfaction.

Incidentally, make your inspection formal. Don't hide it. Make a display of it. Always have a supervisor accompany you. Invite an employee representative along. Word of mouth will see to it that others are aware of your time and effort to inspect for unsafe conditions.

ORDERING PROMPT CORRECTIVE ACTIONS

When your supervisors report conditions that require your authorization to correct, your decisions will greatly influence how effectively they make inspections in the future. If you communicate a reluctance to spend money for the correction of unquestionable unsafe conditions, you can be sure they will transfer that same reluctance to their inspection activity. Why report unsafe conditions, they may think, when nothing gets done anyway. Prompt correction has the reverse effect. It reinforces inspection activities.

KEEPING A DEPARTMENTAL LOG ON DEFERRED ITEMS

It is not always feasible to act immediately to correct unsafe conditions reported. Action may have to be deferred to allow time to study the condition, to get technical advice, to get approval from higher plant management, or to plan the best correction.

Whenever corrective action is deferred for any reason, the condition should be recorded in an unsafe conditions log. Unless it is logged, it runs the risk of being forgotten. When that happens, the person who reported the condition may conclude there is a lack of concern for safety.

The log should be regularly reviewed to make a final decision on the items listed. If the decision is against correcting a condition reported as

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unsafe, it should be explained to the supervisor or employee who requested a correction of the condition.

PUBLICIZING CORRECTED UNSAFE CONDITIONS

One way to motivate an interest in inspection, and also to convince employees about the department's concern for safety, is to publicize each month what conditions have been corrected. Both hourly employees and supervisors should be acquainted regularly with what conditions have been corrected. Sizable expenditure for safety should also be communicated. Employees know talk can be cheap. They are more likely to be impressed by what is done than what is said.

Use safety meetings and bulletin boards to communicate what unsafe conditions have been corrected. The rule is, if it costs money to correct, let people know about what was done.

BEING A STICKLER ON GOOD HOUSEKEEPING

The superintendent who is a stickler on good housekeeping influences more than housekeeping. He influences inspection for all unsafe conditions. Perhaps even more important he influences a strengthening of discipline in supervisory and non-supervisory employees alike. There is a generalization that a clean and orderly plant is also an efficient plant. Orderly work places reflect orderly people.

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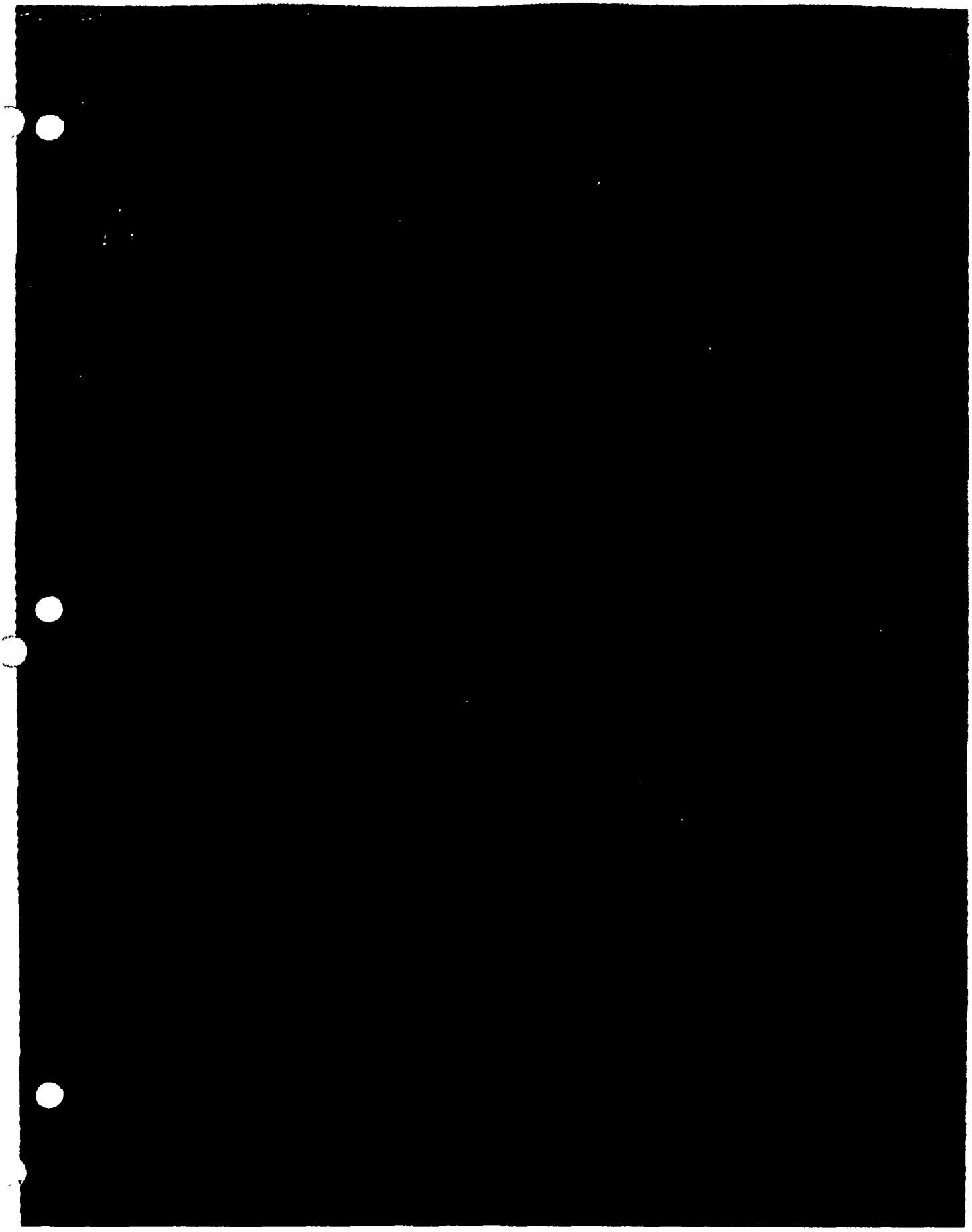

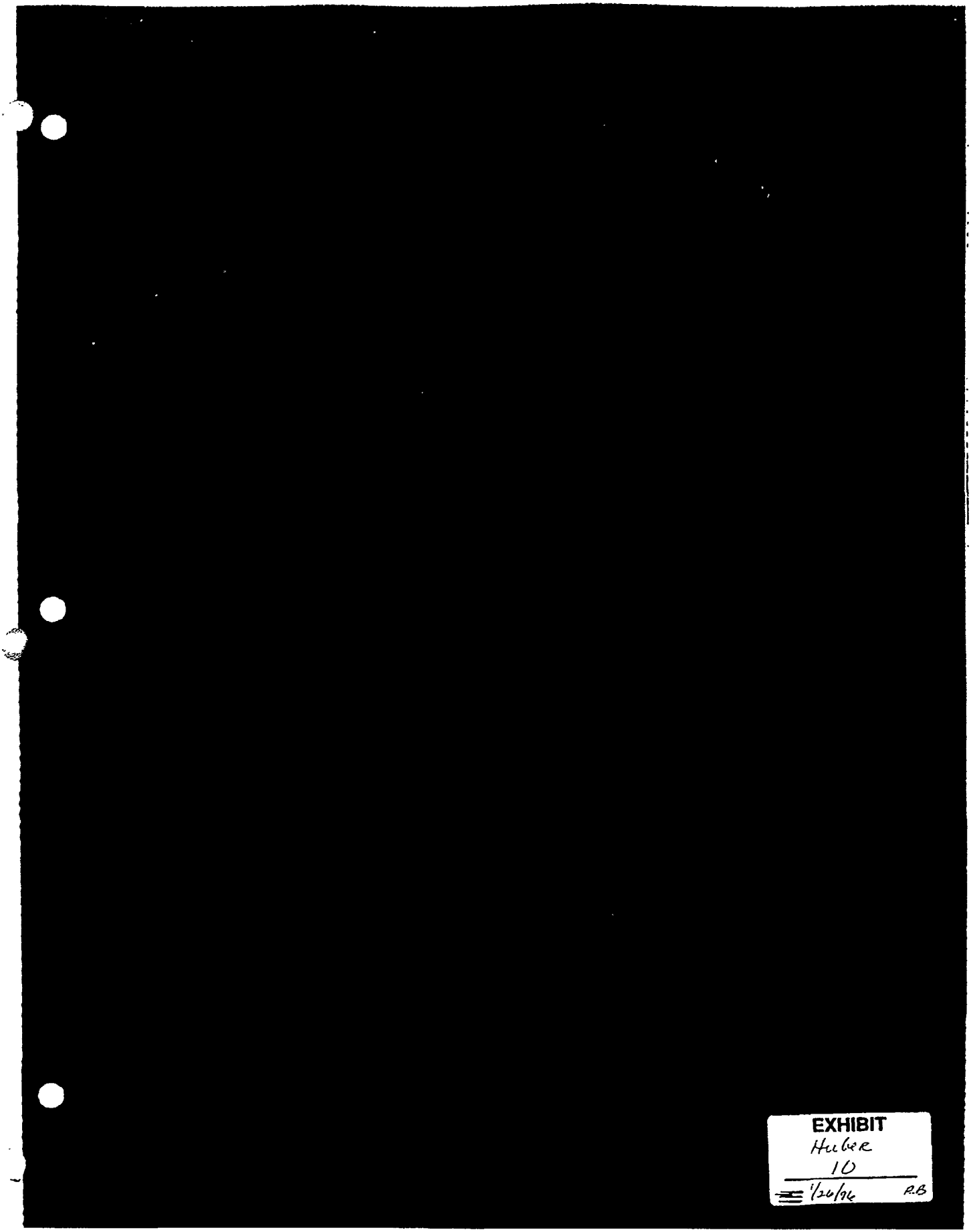
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