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Safety Professionals Meet

Second Safety Professionals Meet was conducted jointly by Safety Engineers Association (India) and National Safety Council, Tamilnadu Chapter, in association with Inspectorate of Factories, Govt. of Tamilnadu, Chennai on 10th Feb. 2005.

Dr. M. Lakshmanan, President, Safety Engineers Association, in his welcome address, briefed on the success of the first such safety professionals meet held, in the year 2003 and unanimous feed-back from participants requesting to continue conducting the meet every year.

Shri K.A. Mohamed Aziz, Chief Inspector of Factories, Govt. of Tamilnadu, inaugurated the meet. He advised safety officers to be committed to the job of safety promotion in industry and aim for 'Zero Accident' target. He offered valuable guidelines for safety

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Inside....

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WRONG TOOL SELECTION RESULTS IN INJURY - A CASE STUDY

WHAT HAPPENED?

Two crew members were working together to remove Allen head bolts that secure a flange to the drum. The drum had been removed from the skid and secured. The tools selected for the job were a ¾" drive impact wrench and socket, and a standard 9/16" Allen key. The tools were fitted up and the impact wrench was engaged. The tapered fit friction of the Allen head end of the bolt allowed the nut to break initially without applying torque against the Allen key. The impact wrench operator continued and as the nut loosened, friction lock was lost and the torque was transferred to the Allen key because lock nut was still bound to the bolt. The Allen key shaft length was a standard size and not long enough to reach against the drum. The torque now being applied through the bolt to the Allen key was more than the other employee could hold. The Allen key slipped from his hand spun 3 or 4 times and was thrown free. The Allen key struck the injured employee in the forehead and above the upper lip requiring stitches in both places.

Flange with Allen wrench in bolt

Nut that Impact wrench was attached

WHAT CAUSED IT?

The investigtion revealed that there had been little consideration to tool selection other than they did fit, and were in good shape. The potential hazard associated with using an impact wrench (which turns at high speed) with a standard Allen key were not considered. While the tools did fit and were in good condition, it was obvious that they were inapprorpirate for the task in the way they were used. Impact wrenches free spin at several thousand rpm, and generate significant torque output at several hundred rpm.

CORRECTIVE ACTIONS

To address this incident, following action items were recommended.

- The back-up wrenches used with impact tools must be firmly secured and personnel cleared from harm's way.
- Jobs requiring impact tools should be listed and approved by supervisor.
- Each job should be studied to see if a "back-up application" exists
- In cases requiring back up ensure that the back up can be secured in a hands-free mode.

■

Safety Professionals ...

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professionals for achieving best results. He also recommended groups of similar industries to share their experiences among themselves and conduct joint programmes for mutual benefits.

Shri R. Thiruvengadam, Chairman, National Safety Council, Tamilnadu Chapter, in his presidential address, appreciated the interest shown by the participants in using the platform for addressing various health, safety and environmental issues by the panel of experts from different departments.

Shri M. Ravichandran, Secretary, NSC (TNC) proposed a vote of thanks.

In the forenoon session, M/s. P. Manoharan and P. Nagarajan presented papers on Modern Safety Management System and Career Options for safety professionals respectively. M/s. S. Ulaganathan, S. Selvaganapathy, M. Ravichandran and S. Ramanujam presented case studies from different high hazard industries.

In the afternoon session, a panel discussion was held with experts from Inspectorate of Factories, Regional Labour Institute (Ministry of Labour), Loss Prevention Association, Electrical Inspectorate, Inspectorate of Boilers, Controller of Explosives, Factory Medical Services, National Safety Council and Safety Engineers Association (India). A large number of participants availed the benefit of clarification on various points from the panel of experts. More than 100 safety professionals took part in this meet.

Seventh Technical Meet on OFFSITE EMERGENCY MANAGEMENT & CASE STUDIES

Mr. S. Ramanujam, Dy. General Manager (Safety) of Saipem India Projecs Services Ltd., Chennai who is also one of the Executive Committee members of SEA (India) made an illustrative presentation on "Offsite Emergency Management" along with relevant case studies on 9th October 2004. His presentation dealt with practical difficulties experienced by the industry involved, service providers regulatory bodies and the neighbourhood, each in their own perspective. Inspite of having documented emergency response procedures, totally new problems emerging during such emergencies were highlighted by Mr. Ramanujam.

About 30 SEA (I) members participated in the programme. At the end of the presentation, there was an interactive session which was very useful to all those present.

It was encouraging to see that a large number of participants from outstation also attended this programme held at Chennai. ■

SAFETY TRAINING PROGRAMME FOR MAPS, KALPAKKAM

A two-day Safety Training Programme was conducted by SEA (India) for Madras Atomic Power Station, Kalpakkam for their middle level management personnel on 21st & 22nd December 2004. M/s. P. Manoharan, R. Subburaman, M. Nithiyananthan and S. Ramanujam were the faculty members. Topics on Factories Act, Electricity Act & Rules, Ergonomics, Chemical Safety, Emergency Planning, Rigging practices and motivation for safety were covered in this programme. More than 30 participants attended the programme. Mr. S.A. Haroon, Head (Fire & Safety), MAPS, who co-ordinated the programme, conveyed the participants' feedback as very informative and useful. ■

READERS – PLEASE NOTE:

Safety Engineers Association (India) offers to conduct Training Programmes, Safety Audit and other professional services on specific requests received from their members and their organisations and Government establishments. Rates, terms and conditions will be provided on request.

— President, SEA (India)

Subscriptions for "Indian Safety Engineer"

Due to popular demand from different organisations, educational institutions and members, it has been decided to accept subscriptions for the "Indian Safety Engineer", official quarterly journal of SEA (India), at following rates:

Annual Subscription	**–**	**Rs. 500/-**
Subscription for a continuous period of five years	**–**	**Rs. 2000/-**

Subscriptions may be forwarded to President. For more details, please write or send email to the association.

NOTE: SEA (India) members are reminded to forward their Annual Membership Subscriptions at the earliest.

COMPLACENCY – ANOTHER CAUSE FOR ACCIDENTS

A dictionary defines complacency this way, "self-satisfaction accompanied by unawareness of actual danger or deficiencies".

There is no doubt that numerous accidents have occurred due to allowing ourselves to become complacent in our everyday activity. (On and off the job)

Working safely will not just happen, nor is it easy and automatic. We have to work at it with the highest degree of awareness and commitment.

If we just stop for a moment and think, we all can come up with instances that we did become complacent. It happens to us because we perform many functions on an almost continuous basis. Many of our jobs are repetitive in nature and the more we repeat what we are doing, the better the chance that we are becoming complacent without even realizing it. Therein lies the potential danger, the danger of complacency.

We must remember that life is what happens when we are making other plans. We become complacent about our personal safety by repeated exposure to situations without consequence.

We, by nature take shortcuts and with the absence of serious consequences, tend to become more lax about our personal safety. In other words we are becoming complacent.

Personal safety is not like a light switch that you can turn on or off. The personal safety switch must continuously be in the on position.

Just because we feel safe, does not mean we are safe. On the contrary, "feeling safe all the time", could be the biggest threat to our well being, because we are drifting into that complacent mode.

One key to avoid the complacency trap is to make "safety practices" as your habits. Habits that you do over and over until they override your former unsafe behaviour and become automated. You know habits die hard.

Habits such as, wearing gloves, glasses, proper foot wear, safety harness on and ready to tie off, face shield when grinding, removing tripping hazards, attending safety meetings and paying attention, using seat belts, tying off a ladder etc etc.

Is it not better to form these types of automatic habits and let them become the norm?

There is an old saying that 'familiarity breeds contempt'. We can rephrase it as 'familiarity breeds complacency'. Let us work in a manner that we ensure, not to fall into the complacency trap.

World events have forever changed the way we live and act in our daily lives. Many of the things we took for granted have been inexorably modified and we are forced to adapt our once-comfortable routines to accommodate the changes. Travelers notice an increased presence of security personnel in airports, train stations, parking lots and other public venues. Our streets are patrolled more often and by greater numbers of police and security personnel. There is an increase in neighborhood watch groups and our lives are suddenly less private.

We are on edge and very concerned. We worry at every turn that some evil might lurk in a hidden corner where we least expect it. We plan our activities with greater detail and vary our daily regimen a bit to be a little less predictable. We want to be prepared. But who is the enemy? Whom should we watch out for? There are many fanatical factions in the world that could justifiably be labeled an enemy. However, of all the multifaceted dangers that do present themselves, complacency may well be our biggest adversary.

Complacency is a self-satisfied state of mind oblivious to any danger present. We regularly experience complacency in our personal lives and at our jobs. The key is being cognizant of its existence and the measures we can take to offset any negative consequences. The places we feel the most familiar with can be the most perilous because the menace is not so obvious to us. When we feel confident that the environment is stable, we often forget things are subject to change and become precarious in an instant. We must learn to react and interact with our surroundings to ensure we are alert to the possibilities of catastrophe.

Complacency is an attitude that determines how we respond to

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LIMITATIONS OF CARTRIDGE-TYPE RESPIRATORS

A half mask cartridge-type respirator is the most common type used for protection against organic vapors, dusts, mists, acid gases and fumes. You should be aware, however, that respirators of this type provide adequate protection only under limited conditions. This type of respirator is designed mainly for short-term operations that do not contain atmospheres that are "immediately dangerous to life." To use this type of respirator you must know both the type and concentration of contaminants in the air.

Cartridge type respirators are approved only for low concentrations of contaminants in the air. Look for permissible limits of exposure on the canister. If not specified, the maximum permitted level will depend on the "respiratory protection factor" (a measure of the degree of protection provided to the wearer). If a *qualitative* fit test is used (for example, smoke tubes) a respiratory protection factor of 10 must be used. To determine the maximum concentration of airborne contaminants permitted in the air where the respirator will be used, the permissible time weighted average concentration (TWA or TLV) of the contaminant is multiplied by 10. For example, the TLV for lead fume is .15 mg/m^3, so the maximum concentration permitted in the air when using this type of respirator is 1.5 mg/m^3. (TLVs are published by the American Conference of Governmental Industrial Hygienists (ACGIH).

Also, remember that a cartridge-type respirator *does not* provide or generate breathing air and the oxygen content of the area must be at least 19.5% to use this type of respirator. In addition, it must also be worn only in the presence of moderately toxic air contaminants that have *distinctive warning properties such as odor, irritation, or taste.* The purpose of this requirement is to allow the user to tell when the cartridges have become exhausted. If you can detect the contaminant inside the mask, it means you must exit the area immediately and change the cartridge.

Other things you should be aware of when wearing a cartridge-type respirator:

- Never enter a confined space with a cartridge-type respirator unless you know for sure that the space has been *tested* for oxygen content and toxic air contaminants and that entry with this type of respirator is allowable and that entry has been *approved* by competent agency.
- Never work in toxic vapors for which the respirator cartridge is not intended. There are many different types and combinations of cartridges – each for a specific type of hazard that is described on the band surrounding the cartridge. Also be sure the cartridges are the type the manufacturer specifies for your respirator. In general, they are not interchangeable from one manufacture to another. Ask your supervisor if you have doubts about these factors.
- Be sure your respirator fits your face properly. Most manufacturers provide at least three sizes of face pieces and one of them should fit you better than others. Your supervisor will help you select the proper size so that you get a good respirator fit.
- Be sure to check the respirator seal by performing *positive* and *negative* pressure tests immediately prior to entering a contaminated area. Tighten the straps and move the respirator around if you can't get a good seal. Beards, mustaches and long sideburns usually prevent obtaining a good seal.

Cartridge respirators are safe to use if you understand their limitations and how to use them properly. ■

Complacency ...

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given situations. How many times have we heard the statement, "We have always done it that way". Of course, it must be right if it has stood the test of time and repetitiveness. Not necessarily true! The very fact it is repeated often can draw us into the complacency trap – we learn to expect proven results until one day, the outcome changes for the worse.

Complacency is a known problem and must be clearly recognised as a casual factor in accidents. There is no cure for complacency, but we must be ever diligent in our prevention efforts. ■

SAFE WORK IN CONFINED SPACES

As per a statistics from United Kingdom on an average, work in confined spaces kills 15 pople every year across a wide range of industries. In addition, a number of peole are seriously injured. Those killed include not only people working in the confined space but also those who try to rescue them without proper training and equipment.

What is confined space?

It can be any space of an enclosed nature where there is a risk of death or serious injury from hazardous substances or dangerous conditions (eg. lack of oxygen).

Some confined spaces are fairly easy to identify, eg. enclosures with limited openings:

- storage tanks
- silos
- reaction vessels
- enclosed drains
- sewers

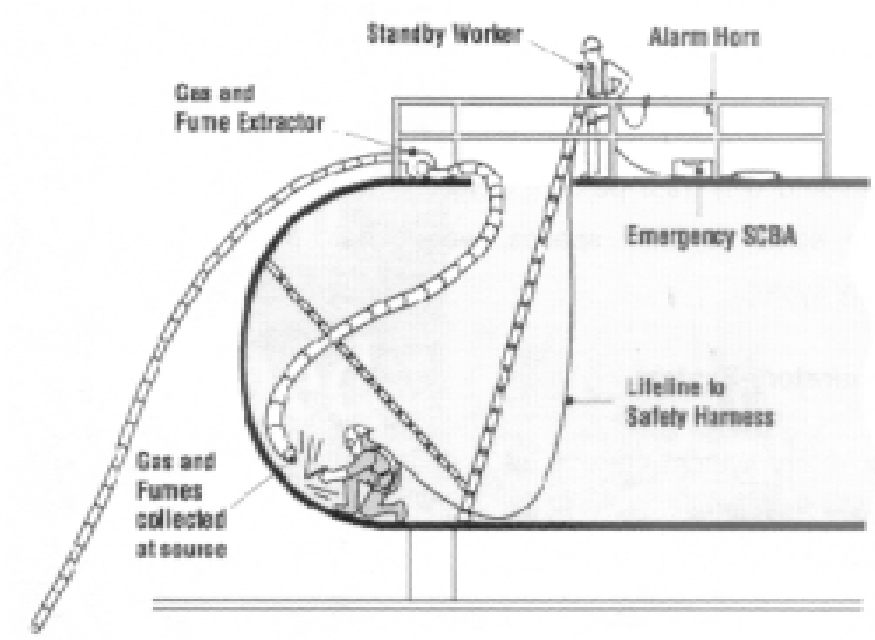
Others may be less obvious, but can be equally dangerous, for example:

- open-topped chambers
- vats
- combustion chambers in furnaces, reactors etc.
- duct work
- unventilated or poorly ventilated rooms

It is not possible to provide a comprehensive list of confined spaces. Some places may become confined when work is carried out, or during their construction, fabrication or subsequent modification.

What are the dangers from confined spaces?

Dangers can arise in confined spaces because of:



- lack of oxygen

  This can occur:

  * following the action of water on limestone which can produce carbon dioxide and displace normal air
  * as a result of the contents reacting with oxygen inside the space
  * inside steel tanks and vessels when rust forms consuming the oxygen content

- Poisonous gas, fume or vapour

  These can

  * build-up in seweres and manholes and in pits connected to the system
  * enter tanks or vessels from connecting pipes
  * leak into trenches and pits.

- Liquids and solids which can suddenly fill the space, or release gases into it, when disturbed. Free flowing solids such as grain can also partially solidify or 'bridge' in silos causing blockages which can collapse unexpectedly.
- Fire and explosions.
- Residues left in tanks, vessels, etc. or remaining on internal surfaces which can give off gas, fume or vapour.
- Dust may be present in high concentrations, eg. in flour silos.
- Hot conditions leading to a dangerous increase in body temperature.

Some of the above conditions may already be present in the confined space. However, some may arise through the work being carried out, or because of ineffective isolation of plant nearby, eg. leakage from a pipe connected to the confined space. The enclosure and working space may increase other dangers arising through the work being carried out, for example:

- not having special precautions, such as provision of dust extraction for a portable grinder, or special precautions against electric shock;

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Safe working...

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- gas, fume or vapour can arise from welding, or by use of volatile and often flammable solvents, adhesives, etc.
- if access to the space is through a restricted entrance, such as a manhole, escape or rescue in an emergency will be more difficult.

You must carry out a suitable and sufficient assessment of the risks for all work activities for the purpose of deciding what measures are necessary for safety.

For work in confined spaces this means identifying the hazards present, assessing the risks and determining what precautions to take are very important. In most cases the assessment will include consideration of:

- the task
- the working environment
- working materials and tools
- the suitability of those carrying out the task
- arrangements for emergency rescue.

If your assessment identifies risks of serious injury from work in confined spaces, following steps need to be considered:

- avoid entry to confined spaces, eg. by doing the work from outside
- if entry to a confined space is unavoidable, follow a safe system of work; and
- put in place adequate emergency arrangements before the work starts.

Avoid entering confined spaces

You need to check if the work can be done another way so that entry or work in confined spaces is avoided. Better work-planning or a different approach can reduce the need for confined space working.

Ask yourself if the intended work is really necessary, or could you:

- modify the confined space itself so that entry is not necessary
- have the work done from outside, for example:
  * blockages can be cleared in silos by use of remotely operated rotating flap devices, vibrators or air purgers
  * inspection, sampling and cleaning operations can often be done from outside the space using appropriate equipment and tools;
  * remote cameras can be used for internal inspection of vessels.

Safe systems of work

If you cannot avoid entry into a confined space make sure you have a safe system for working inside the space. Use the results of your risk assessment to help identify the necessary precautions to reduce the risk of injury. These will depend on the nature of the confined space, the associated risk and the work involved.

Make sure that the safe system of work, including the identified, is developed and put into practice. Everyone involved will need to be properly trained and instructed to make sure they know what to do and how to do it safely.

The following checklist is not intended to be exhaustive but includes many of the essential elements to help prepare a safe system of work.

Appointment of a supervisor

Supervisors should be given responsibility to ensure that the necessary precautions are taken, to check safety at each stage and may need to remain present while work is underway.

Are persons suitable for the work?

Do they have sufficient experience of the type of work to be carried out, and what training have they received? Where risk assessment highlights exceptional constraints as a result of the physical layout, are individuals of suitable build? The competent person may need to consider other factors, like fitness to wear breathing apparatus, and medical advice on an individual's suitability etc.

Isolation

Mechanical and electrical isolation of equipment is essential if it could otherwise operate, or be operated, inadvertently. If gas, fume or vapour could enter the confined space, physical isolation of pipework etc. needs to be made. In all cases a check should be made to ensure isolation is positive and effective.

Cleaning before entry

This may be necessary to ensure fumes do not develop from residues etc. while the work is being done:

Check the size of the entrance

Is it big enough to allow workers wearing all the necessary equipment to climb in and out easily, and provide ready access and egress in an emergency? For example, the size of the opening may mean choosing air-line breathing apparatus in place of self-contained equipment which is more bulky and therefore likely to restrict ready passage.

Provision of ventilation

You may be able to increase the number of openings and therefore improve ventilation. Mechanical

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Safe working...

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ventilation may be necessary to ensure an adequate supply of fresh air. This is essential where portable gas cylinders and diesel-fuelled equipment are used inside the space. **Warning:** ***carbon monoxide in the exhaust from petrol engines is so dangerous that use of such equipment in confined spaces should never be allowed.***

Testing the air

This may be necessary to check that it is free from both toxic and flammable vapours and that it is fit to breathe. Testing should be carried out by a competent person using a suitable gas detector which is correctly calibrated. Where the risk assessment indicates that conditions may change, or as a further precaution, continuous monitoring of the air may be necessary.

Provision of special tools and lighting

Non-sparking tools and specially protected lighting are essential where flammable or potentially explosive atmospheres are likely. In certain confined spaces suitable precautions to prevent electric shock include use of low voltage equipment, (typically less than 24 V) and, where necessary, residual current devices.

Provision of breathing apparatus

This is essential if the air inside the space cannot be made fit to breathe because of gas, fume or vapour present, or lack of oxygen. Never try to 'enrich' the air in a confined space with oxygen as this can greatly increase the risk of a fire or explosion.

Preparation of emergency arrangements

This will need to cover the necessary equipment, training and practice drills.

Provision of rescue harnesses

Lifelines attached to harnesses should run back to a point outside the confined space.

Communications

An adequate communications system is needed to enable communication between people inside and outside the confined space and to summon help in an emergency.

Check how the alarm is raised

It is necessary to station someone outside to keep watch and to communicate with anyone inside, raise the alarm quickly in an emergency and take charge of the rescue procedures.

Insisit on 'permit-to-work' system

A permit-to-work ensures a formal check is undertaken to ensure all the elements of a safe system of work are in place before people are allowed to enter or work in the confined space. Essential features of a permit-to-work are:

- clear identification of who may authorise particular jobs (and any limits to their authority) and who is responsible for specifying the necessary precautions (eg. isolation, air testing, emergency arrangements, etc.)
- provision for ensuring that contractors engaged to carry out work are included
- training and instruction in the issue of permits
- monitoring and auditing to ensure that the system works as intended.

Emergency procedures

When things go wrong, people may be exposed to serious and immediate danger. Effective arrangement for raising the alarm and carrying out rescue operations in an emergency are essential.

Contingency plans will depend on the nature of the confined space, the risks identified and consequently the likely nature of an emergency rescue.

Emergency arrangements will depend on the risks. You should consider:

Communications

How can an emergency be communicated from inside the confined space to people outside so that rescue procedures can start? Also, consider what might happen and how the alarm can be raised.

Rescue and resusciation equipment

Provision of suitable rescue and resusciation equipment will depend on the likely emergencies identified. Where such equipment is provided for use by rescuers, training in correct operation is essential.

Capabilities of rescuers

There need to be properly trained people, sufficiently fit to carry out their task, ready at hand, and capable of using any equipment provided for rescue; eg. breathing apparatus, lifelines and fire-fighting equipment. Rescuers also need to be protected against the cause of the emergency.

Shut down

It may be necessary to shut down adjacent plant before attempting emergency rescue.

First-aid procedures

Trained first-aiders need to be available to make proper use of any necessary first-aid equipment provided. ■

ELECTRICAL SAFETY AT CONSTRUCTION SITES

Electric shock, and too often fatalities, occurs on construction job sites when temporary power systems are in use. All construction workers who operate power tools should receive training in the systems, which safeguard them from electric hazards. They should know the answers for a few questions as follows:

1. What is the difference between an 'Assured Equipment Grounding Program' and Earth Leakage Circuit Breaker (ELCB)?

   An Assured Equipment Grounding Program is a scheduled system for testing construction site electrical tools and extension cords to assure their proper grounding, polarity and resistance.

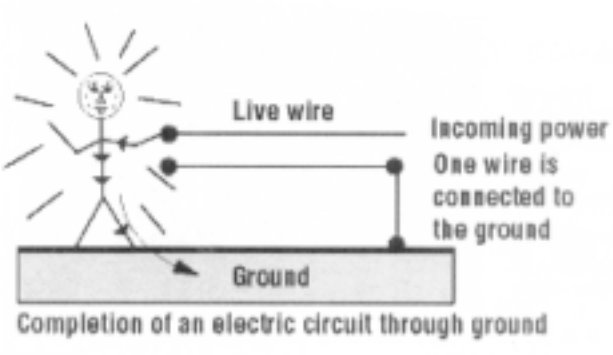
   A ELCB is an equipment that serves as a circuit breaker if it senses a 5 milliamp or greater difference in current between the hot and neutral sides of the circuit.

2. Under what conditions must ELCB be used on a worksite?

- When electrical tools and extension cords are used in connection with the process of construction or alteration - and
- When 220 volt, single-phase, 15-ampere outlets are being used, which are not a part of the permanent wiring of buildings or structures.

3. Under what conditions are ELCB 's not required?

- When the company has an established, implemented, Assured Grounding Conductor Program that systematically tests for continuous circuitry on electrical tools being used on the worksite.
- When employees are instructed NOT to use any equipment that does not meet the requirements of the Assured Grounding Program.



Completion of an electric circuit through ground

4. When must electrical tools and extension cords be tested for grounding and continuity of the circuitry?

- before first use
- when returned to service following repairs
- at least every three months on a scheduled basis

5. What types of defects should workers continually look for?

- Workers should look for deformed or missing pins, insulation damage and indications of possible internal damage.

6. What does the Assured Grounding two-colour coding system identify?

- The first color (usually colored tape applied to the cord) identifies the quarter in which the equipment was last tested; the second color identifies the month within the quarter when the last test took place.

7. What equipment is exempted from Assured Grounding tests?

- "Double insulated" tools, which are clearly marked and identifiable as a double insulated tool usually by a "D in a square". Workers, before each use, should nevertheless inspect these tools for cord damage or case damage and may also be taped for inclusion in the overall program.

8. What kind of records are kept on an Assured Equipment Grounding Program and who keeps them?

- The color-coding system must be maintained as part of the company's written safety program. A log of the items inspected and date of the test must be kept by an authorised person who is

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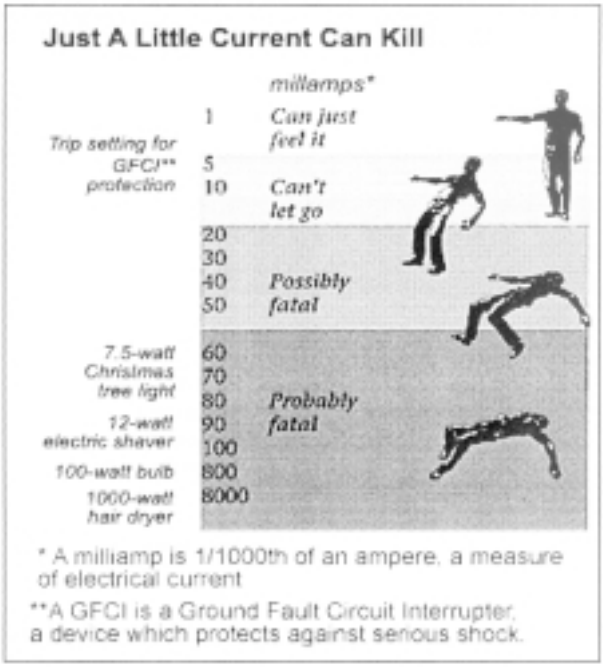

IN THE NEWS...

ISO publishes improved versions of ISO 14000 environmental management system standards

ISO has published revised, improved versions of its **ISO 14001** and **ISO 14004** standards and expects them to put the benefits of implementing an **environmental management system (EMS)** within the reach of an even greater number and variety of organizations worldwide.

"These standards represent the state of the art in environmental management practice," affirmed ISO Secretary-General, "and are at the leading edge of ISO's comprehensive offering to help organizations address all three dimensions of sustainable development - social, economic and environmental."

ISO 14001:2004 specifies the requirements for an EMS which provides a framework for an organization to control the environmental impact of its activities, products and services, and to improve its environmental performance continually. ISO 14004:2004 provides guidelines on the elements of an EMS, its implementation and the principal issues involved.

Chairperson of the ISO technical group that developed the two standards, provided an executive summary of the improvements: "These revised versions take account of the considerable body of user experience since the standards were first published in 1996. ISO 14001:2004 is easier to understand and easier to use. The intent of its requirements has been made clearer, which will facilitate its translation and consistent implementation around the world. In addition, its compatibility with the ISO 9001:2000 standard for quality management systems, which is also used worldwide, has been increased."

"In turn, ISO 14004:2004 is more consistent and compatible with ISO 14001:2004, which will encourage their joint use and so enrich understanding of EMS. The language of ISO 14004 has also been made more accessible to small and medium-sized enterprises. As these make up the vast majority of businesses in the world, it is very much in everyone's interest that they too implement the good environmental management practices distilled in ISO 14001:2004 and ISO 14004:2004."

ISO 14001 is the standard against which an organization may have its EMS audited by an independent certification body that then vouches for the conformity of the system to the standard's requirements by issuing an "ISO 14001 certificate". Certification is not a requirement of the standard, but many organizations have chosen this option because of the perceived credibility of an independent verification. Up to the end of December 2003, at least 66 070 certificates to ISO 14001:1996 had been issued in 113 countries and economies, over 34% more than the previous year and the largest annual increase so far recorded by the ISO Survey.

Secretary-General, ISO announced: "Although ISO itself does not carry out certification, we wish to ensure a smooth transition to ISO 14001:2004 for organizations currently certified to ISO 14001:1996. We have therefore been cooperating to develop a joint policy for the transition with the International Accreditation Forum (IAF)."

ISO and the IAF have agreed to set the period for making the transition from certificates of conformity to ISO 14001:1996 to the ISO 14001:2004 version at 18 months from the publication date of the latter. Beyond this period, the IAF will recognize only certificates to ISO 14001:2004.

OSHA proposes Revised Rule on Hexavalent Chromium

OSHA is proposing three separate standards that cover exposure to Hexavalent Chromium (Cr-VI) in general industry, construction and shipyards.

"The risks involved in the occupational use of hexavalent chromium can be serious and potentially life threatening", said OSHA Administrator. "This proposed rule is both economically and technologically feasible, and will substantially reduce the risk to workers potentially exposed to hexavalent chromium".

OSHA is also proposing to lower its permissible exposure limit (PEL) for hexavalent chromium and for all CrVI compounds in construction, shipyards, and general industry.

The proposed rule also includes provisions for employee protection such as preferred methods for controlling exposure, respiratory protection, protective work clothing and equipment, hygiene areas and practices, medical surveillance, hazard communication and record keeping.

Cr-VI compounds are widely used in the chemical industry in pigments, metal plating and chemical synthesis as ingredients and catalysts. Cr-VI can also be produced when welding on stainless steel or Cr-VI-painted surface. The major health effects associated with exposure to Cr-VI include lung cancer, asthma, nasal septum, skin ulcerations (or chrome holes), and allergic and irritant contact dermatitis.

IN THE NEWS...

OSHA offers New Guidance for reducing Perchloroethylene Exposure in Dry-cleaning

Reducing worker exposure to perchloroethylene in dry-cleaning is the name and goal of a new publication unveiled by the Occupational Safety and Health Administration (OSHA). Perchloroethylene is a commonly used chemical in the dry-cleaning industry that can pose serious health hazards.

Perchloroethylene is a volatile organic chemical that can cause serious health hazards. Dry-cleaning workers who routinely breathe the solvent's vapors or spill it on their skin are at risk of developing health problems, including skin, liver and kidney damage, and possibly cancer. The inhalation of the chemical has been shown to cause numerous health effects such as dizziness, loss of coordination, memory loss and blistering of skin.

The new document provides information on the health hazards and current regulations, as well as recommendations on methods for reducing worker exposures. It also provides information on training, personal protective equipment, and some of the new technologies available in the dry cleaning industry.

The publication also addresses how good work practices can greatly minimize worker exposure to Perchloroethylene vapors. For example, peak exposure levels can be reduced by several hundred parts per million simply by proper positioning of the head and body during transfer operations. Other important work practices to reduce exposure are listed below:

Work practice Tips for dry-cleaning operators

- Do not load the machine past its capacity
- Do not open the machine door when the cycle is running
- Keep the machine door CLOSED as much as possible
- Do not 'short cut' the drying cycle by removing garments from the machine before the cycle is finished
- Keep the head and face turned away from machine door and clothes when removing solvent-laden clothes from the washer
- Avoid manually handling Perchloroethylene. Instead, use a closed piping system that delivers Perchloroethylene directly to the machine drum
- WAIT until the machine and solvent are cold before performing maintenance
- Use Perchloroethylene-free spotting agents, if possible
- Use spotting agents sparingly
- Clean up Perchloroethylene spills immediately. (The shop should have in place a plan for safely responding to spills.
- Store containers of Perchloroethylene and Perchloroethylene wastes in tightly sealed containers.

OSHA Partnership with Unions, Companies and State will protect workers

The safety and health of workers at one of the largest highway construction projects in the history of central Illinois has received a boost, thanks to a partnership agreement between the U.S. Department of Labor's Occupational Safety and Health Administration (OSHA), three local companies, five local unions, and the state of Illinois.

The alliance was signed by OSHA's Area Office with a joint venture comprised of the three local companies. The partnership was also signed by Carpenters, Cement Masons, Iron Workers, Laborers, Operators, and the Illinois Department of Commerce and Economic Opportunity – On-Site Safety and Health Consultation Program. This is the second partnership developed by OSHA for this road construction project which is scheduled for completion in December 2006.

"The goal of this partnership is to eliminate or control workplace hazards and prevent construction fatalities and serious injuries. That challenge demands a cooperative and coordinated effort. This partnership provides a framework for that effort," said OSHA's area director.

The specific goals of the partnership are to maintain the total case rate for injuries and illnesses on the project at least 10 percent below the average for construction and to increase the number of hazards that are eliminated or controlled within one day. Other goals are to provide at least 20 hours of safety and health training to all of the joint venture's supervisors and to increase the number of subcontractors who have written safety programs for employees working on the project.

OSHA and the state of Illinois will work with joint venture contractors and labor unions to implement effective safety and health programs that include management and union commitment, employee involvement, hazard elimination or control, and training. Joint venture contractors will implement a comprehensive safety and health program to ensure that employee exposures to air contaminants, including silica, do not exceed OSHA limits.

OSHA will conduct at least one focused monitoring inspection within six months as part of the partnership and annually thereafter.

OSHA health and safety alliances are part of U.S. Labor Secretary's ongoing efforts to improve health and safety for workers through cooperative partnerships. Employers are responsible for providing a safe and healthy workplace for their employees. OSHA's role is to ensure the safety and health of America's workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships, and encouraging continual process improvement in workplace safety and health.

TOOL BOX TALK (TBT): SAFE RIGGING PRACTICES

Rigging looks like an easy operation, one that doesn't seem to require any particular skill or experience. But don't be fooled. Many people who've thought that "anyone can do it" have lost fingers or hands or suffered more serious injuries. We don't want any one injured while rigging on this job. So I'm going to point out some of the "do's and don'ts." Pay close attention.

GET YOUR SIGNALS STRAIGHT

Appoint one member of the crew to act as signalman and instruct the crane operator not to accept signals from anyone else. The signalman must not order a move until getting an "All Clear" from each crew member. Each worker in turn must be in the clear before giving an "All Clear" to the signalman. If you must hold on to the chain, sling, choker or what ever to maintain tension, be sure your hands and feet are out of the way of pinch points before giving an "All Clear."

PROTECT YOUR HANDS

If it isn't possible to release the chain, sling, or choker, be sure your hand is clear of pinch points. In fact, keep your hand far enough away so that a frayed wire or splinter on the chain can't catch your glove and jerk your hand into a pinch point.

WATCH OUT FOR ROCK AND ROLL

It is almost impossible to position the hook exactly over the load center. So, watch out for a swing or roll. Anticipate the direction of the swing or roll and work away from it. Never place yourself between material, equipment or other stationary objects and the load. Stay away from stacked material that may be knocked over by a swinging load.

STAY OUT FROM UNDER

Never get under a suspended load, and keep out from under the crane's boom too. May be the chances of breakage are freak. But are you willing to bet life and limb that it won't?

SET IT DOWN CAREFULLY

It is a good practic to guide a load, using a tag line or hook. If you have to walk with a load, keep it as close to the ground as possible. Before hand, look over the spot where the load is to be landed. Remove unnecessary blocks or the objects that might fly up when struck by the load. When lowering or setting a load, keep your feet and all other parts of your body out from under. Set the load down easily and slowly. Then, if it rolls on the blocking, it will shift slowly and you'll be able to get away.

TEAMWORK IS THE SECRET OF SAFETY

Teamwork is important on any job to prevent injury to yourself or others. But on a rigging job, this goes double. ■

Electrical Safety...

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competent to recognise electrical hazards.

9. When there are company and subcontractors personnel on a job site, who is responsible for the assured grounding or ELCB program?

- Each subcontractor on a job may use his own individual program, but the company and subcontractors alike are responsible for having a program in place – preferably coordinated. (Good companies insist on a coordinated program to avoid mishaps, cross color-coding and to help maintain enforcement. The color-code within a "test period" are often displayed in a visible location by the inspector, for all workers to see).
- Unless the company provides an "Assured Equipment Grounding Program" for central power and all portable power stations at jobsite locations, subcontractors must provide their own ELCBs for all temporary power use.

10. When should Assured Grounding or ELCB training be provided to construction workers and what should be included in the training?

- All new employees to the jobsite, who use electrical tools, should receive training or a review of this electrical safety program
- Training should at least include:
  - the purpose of these electrical safety measures
  - the colour code sytem in operation
  - how to identify electrical hazards
  - procedures for reporting electrical hazards
  - ELCB uses and limitations ■

A DATA SHEET ON CHROMIUM

WHAT IS CHROMIUM?

Chromium and its compounds form a large and varied group of chemicals, the hazards of which depend on the chemical forms encountered. These are referred to as chromium metal (0) chromium (II), chromium (III), chromium (IV) and chromium (VI). Of these, chromium (VI) compounds have the most significant effects on health.

WHERE IS IT FOUND?

Chromium and its compounds are used or found in many processes and products.

- In the production and use of stainless teel and other chromium alloys
- In pigments for paint and pottery
- In wood preservatives
- In catalysts in the chemical manufacturing industry
- In the production of dyestuffs
- In electroplating/anodising

HOW DOES IT GET INTO YOUR BODY?

- By breathing in dust, fume or mist
- By skin contact with solutions or solids
- By eating, drinking or smoking in areas where chromium may be encountered

WHAT ARE THE HEALTH HAZARDS?

Chromium (VI) compounds (chromates, bichromates, chromic acid) pose the most significant health hazards.

Short-term effect include:

- Irritation and inflammation of the nose and upper respiratory tract
- Burns to the skin, possibly leading to ulcers
- Eye damage from splashes

Long-term effects can include:

- Damage to the nose, including ulcers and holes in the flap of tissue separating the nostrils
- Irritation of the lungs
- Kidney damage
- Allergic reactions in the skin and respiratory tract
- Risk of cancer of the lung and nose from certain processes

WHAT SHOULD YOU DO?

- Avoid breathing in dust, fume or mist and skin contact
- Use the extraction equipment or other control measures correctly
- Use the chemical / mechanical spray suppressants at plating baths, where provided
- Use the protective clothing and equipment provided
- Use the washing facilities provided which should be adequate and suitable for your needs
- Use appropriate skin creams
- If you have to wear a respirator make sure:
  - it fits properly
  - it is clean
  - the filter is changed regularly
  - you have been trained how to use it
- Wash any affected areas thoroughly without delay if accidental skin or eye contact occurs.
- Report defects in enclosures, extraction equipment, or other control measures to your employers.
- Do not eat, drink or smoke in chromium work areas.

WHAT ABOUT HEALTH CHECKS?

- The health of people exposed to dust, fumes or mist from certain forms of chromium and its compounds may require health surveillance by an occupational health specialist or a doctor.
- An initial check should, where appropriate, include details of your past health especially any skin or breathing problems
- You should examine your skin regularly and report any skin complaints.

WHAT ARE SAFE PRACTICES?

- Assess the risks of exposure
- prevent your exposure to chromium and its compounds or, where this is not reasonably practicable, adequately control your exposure
- for chromium (V1) compounds, reduce your exposure so far as is reasonably practicable and in any case below the maximum exposure limit (MEL) of 0.05 mg/m^3 averaged over an 8 hour working day
- for other chromium compounds, reduce your exposure to the occupational exposure standard (OES) of 0.5 mg/m3 averaged over an 8-hour day.
- establish the extent of exposure, normally by means of a monitoring programme
- arrange any appropriate health checks. ■

COMPUTER ERGONOMICS

These days you need not be a software professional to use that dinky little thing called the Personal Computer. Whatever field you are in, you cannot make your day without it. As most of us spend a lot of our time working at the computer workstation, it is worth having a little awareness of its impact on the health and take preventive steps. Proper postures go a long way in preventing all kinds of back/neck pains and eyestrains.

Sitting impatiently in front of a computer can cause various injuries, from the short-term discomposure of headache to potentially incapacitating conditions like Carpal Tunnel Syndrome. In this section of ergnomics, let us see what are the proper possible postures that help you keep the twinge at bay.

Let us start with your workstation chair.

- Ensure your seat height is adjusted so that your feet are flat on the floor with your knees equal to or slightly lower than, your hips.
- Sit with your lower back pushed as far back as it can go in the chair and the shouders touching the backrest.
- Make sure your upper and lower backs are supported with the backrest of your chair reclined to an angle ranging between 90 and 115 degrees. Use inflatable cushions or tiny pillows if necessary.
- If your chair has an active back mechanism, use it to make frequent position changes.
- Ensure you have removable armrests that allow adjustment of the distance between them.
- Keep switching between different postures frequently.

Keyboard fine-tuning

- Make sure you position the keyboard directly in front of your body and pull up close to the keyboard.
- Readjust the keyboard so that its most used section is centred with your body.
- Depending upon your sitting position, adjust the tilt using the keyboard feet so that your shoulders are relaxed.
- Do not rest your wrists or hands on a palm or wrist rest when you are keying. Do make it a habit to take their support only during breaks from keying.
- If you do not have a fully adjustable keyboard tray, try adjusting the height of your chair or use a seat cushion. You can also use a footrest if your feet dangle in air.

Monitor positioning

- Position the monitor so that it is directly in front of you, right above the keyboard in such a way that your neck is in a relaxed position.
- Ensure you have the top of the monitor 2-3" above your seated eye level.
- Distance yourself at least an arm's length away from the screen.
- Ensure you maintain a proper illumination needed for your kind of work.
- Place your monitor at right angle with any windows, because, having a window behind you will cause glare and a window in front of you will cause squinting.
- You can minimise the glare from overhead lights by using a monitor shield or by adjusting the vertical screen angle and screen controls.
- Ensure you place your telephone within easy reach on the side of your non-dominant hand
- Use a headset or speakerphone to avoid neck and shoulder discomfort if you use a phone often all the day.

Take short breaks

- Once in every 20 minutes, do take a short 1-2 minute stretch breaks. Avoid being in front of the computer in lunch breaks.
- Every so often, look away from the computer and focus on something else to avoid eye fatigue.
- Have your eyes checked in case of itching/red eye/watering or any other problem and do not

(contd. on next page)

WHEELBARROWS

The wheelbarrow has come a long way in construction work from the manually propelled wheelbarrow to the engine propelled wheelbarrow for moving material on the construction site. The proper use and maintenance of wheelbarrows can prevent many accidents.

1. Always place the load well forward, balanced and confined in size for safety. The load should clear safely through openings, aisles and roadways. The user should be able to see over and around the load to guide it safely. The load should be secured or held steady, against shifting or falling.
2. When picking up a wheelbarrow, spare your back by giving your legs their fair share of the lifting. Bend the legs for lifting instead of bending the back. Spare your back and the wheelbarrow by never overloading.
3. Always push a loaded wheelbarrow forward. This is the way to avoid being run over. Warn others out of the way. A walking pace is safer than running.
4. Cross over obstacles at the right angle, especially over rails or planks which may divert the wheel causing the load to spill or fall.
5. Like all other construction tools and equipment, wheelbarrows should be stored so that they do not become obstacles and safety hazards for yourself or others.
6. If your wheelbarrow is powered by a gasoline engine, remember that gasoline is a fire and explosive hazard. Remember that gasoline engines produce carbon monoxide gas which can be fatal if the area in which you are working is not well ventilated. Remember, also, that you are dealing with an engine which has more power than you do.
7. Proper maintenance of a wheelbarrow engine is the work of an authorized and qualified mechanic.
8. The wheelbarrow wheel or wheels should be inspected and maintained regularly. Maintain proper lubrication according to directions. Inspect tires for damage. Keep tires inflated according to directions. Keep all bolts and fittings tight and secure.
9. Wheelbarrow handles are for your hands. Replace the handles which are split or splintered. Use handle guards to protect your knuckles from scrapes, cuts and fractures.
10. Accessory equipment, like lines, rails and racks for securing loads, should be maintained in top condition for safety.
11. A wheelbarrow by itself will not harm you or anyone else. You are responsible for how well a wheelbarrow is handled, operated, maintained and stored for safety.
12. The precautions you use with wheelbarrows are not less than the same as the precautions you use with hand trucks, dollies and other mobile equipment. ■

Computer Ergonomics...

(Contd. from previous page)

forget to inform your eye specialist the number of hours you spend in front of the computer.

Laptop Computing

- If you use a side chair while computing, do use a soft pad to support your arm while keying. That way, you can have neutral arm, wrist and hand postures.
- Use appropriate illumination and angle the screen so that it is at right angles to your line of sight.
- Maintain a comfortable viewing distance of about 18-30".
- Try attaching an external mouse instead of using the small-constricted touchpad or trackball.
- Keep cleaning the screen regularly using appropriate antistatic cleaning material.

Besides the proper posture, ensure you do proper exercises that work for you at the office and at home. Do consult your doctor for the kind of exercises that go with the complete office ergonomics programme. ■

DEVELOP AND "SELL" YOUR SAFETY IDEAS

The best ideas for improving the work environment often come from the people who are more exposed to that environment – the workers. But how can employees effectively create solutions to their workplace safety problems, communicate their ideas for improvement to management, and have those ideas seriously considered. Safety professionals should teach these workers how to identify and assess the safety problems and how to subit their solutions to supervisors or safety committees. Basically, two tools are needed for this purpose. (1) A structured approach to identify problems and solving them and (2) A way to submit formal suggestions.

A Five Step Approach to Solving Problems

1. Identify the problem. Perhaps you already have a specific, perplexing safety problem in mind. It may be a piece of equipment or a process within your department that needs improvement. Define the problem as it now exists – the more specific the better. If excess costs are associated with this problem, substantiate these details to explain the problem better. This will also help you develop cost saving solutions.
2. Make a list of options. What are the possibilities available to fix the problem? What are the results you are looking for? Brainstrom a multitude of ideas which could effectively and efficiently eliminate the problematic situation.
3. List the consequences. Your possible solutions may affect someone or some equipment or some system. All ideas have pros and cons associated with them. Consider all sides of the effect each option may have on other departments or workers.
4. Compare the options. How much effort will be required? How much time and money will it take? You may need some help from your supervisor in calculating time and costs.
5. Choose the best options. By discussing these options with your supervisor or someone else who is knowledgeable, you may see the bigger picture of the problem and get a better idea. This will help you in deciding the best choice.

Submitting the Formal Suggestion

1. Describe the current safety problem in a brief, clear, and objective statement. Explain the disadvantages of the present situation.
2. Outline your idea and possible solutions. Briefly detail your suggestion for improvement, avoiding negativity.
3. Include the anticipated effect your idea will have on other workers or equipments or systems.
4. Show how much it will cost to execute your plan and explain what will be the cost benefits after implementation. There must be some monetary benefit to what you are suggesting. If your plan improves safety, what are the expected cost savings associated with preventing an injury that old methods caused? Are there other benefits? Is it more efficient? Will it take less time? Try to state all these benefits in terms of cost savings.
5. Finish with a more in-depth description of your idea. Break your idea down into its component parts. Use drawings and all other pertinent information to emphasize the importance of your idea.

This two-fold method to address safety concerns would better illustrate the issue to those concerned in their taking right decisions and in turn appreciate and reward the proposers. ■