

Argonne National Laboratory - East

ESH/QA Incident/Event Quarterly Performance Analysis

4th Quarter CY 2004

Prepared by:

Tom Barkalow & Will Brocker
ANL-E, EQO Division

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Executive Summary

At ANL-E incident reviews for trends and recurring events are conducted as part of our integrated safety management program implementation. Each incident, ORPS reportable and non-ORPS reportable events, is evaluated with other similar events to identify trends and needed corrective actions to prevent recurrence. The type of incident will determine which process is used to evaluate the incidents for trends. At ANL-E formal processes are established and implemented for injury/illness cases and potential PAAA issues.

For the period from January 1, 2004 to December 31, 2004, 295 incidents were reported by divisions.

For injury/illness cases the process used was:

1. The Division conducted an investigation, evaluated the incident for trends, and developed corrective actions.
2. An EQO safety engineer reviewed all injury/illness cases for trends using the first aid, OSHA recordable and ORPS cases for at least the previous 12 months.
3. At the weekly the Occupational Injury/Illness Review Committee meeting cases are discussed by the committee membership which includes physicians, safety engineers, industrial hygienists and line managers. As appropriate, the committee provided line management recommended corrective actions.

The above injury/illness reviews did not identify any noteworthy trends or recurring events.

For issues and incidents involving radiological materials and/or nuclear facilities the process used was:

1. A review of each reported issue and incident was conducted by the PAAA Coordinator Alternate. The review included an evaluation for trends by the Radiation Safety Officer, the PAAA Coordinator, and other Subject Matter Experts.
2. The PAAA Coordinator Alternate evaluated each potential PAAA issue for NTS reportability and similarity to all other reported events.
3. The PAAA Review Committee and the PAAA Coordinator evaluated the issues and incidents individually and as a group of similar events for NTS reportability.

The above reviews did not identify any noteworthy trends or recurring events.

For other events, such as transportation, environmental releases, etc., EQO discusses these types of events at EQO weekly staff meetings. The discussion includes identification of similar events and no noteworthy trends were identified.

In addition to the above review activities conducted by the Laboratory, at weekly meetings between DOE-ASO and Laboratory management, incidents are discussed and they are reviewed for trends. The weekly meetings did not identify any trends.

Incident Trend Evaluation and Reporting

If trends are identified they are evaluated for ORPS and NTS reportability. ORPS and NTS reports are shared widely throughout the Laboratory. For trends that are not reported into ORPS or NTS, the trend would be reported in our Monthly Safety Report. The Monthly Safety Report is distributed to line managers, ES&H Coordinators and others, and is available on the ANL-E intranet.

Planned Program Improvements

To reduce struck by, or against, injuries a safety alert will be prepared and distributed. The safety alert will include a summary of the struck by/against injuries and methods that should be used to prevent similar injuries.

Areas Requiring Continued Management Attention

ORPS Reports Indicating Management Problem as an Apparent Cause - Management needs to continue its efforts to improve work planning, selecting qualified workers, identifying and analyzing hazards, developing and implementing control measures and conducting assessments to assure work is performed within controls.

Prevention of Struck by and Stuck Against Injuries – The review of the 51 injuries caused (33% of all injuries) by a body part striking or being struck by an object identified the following:

- 10 incidents involved a body movement that resulted in a body part striking an object;
- 8 incidents occurred during material handling that resulted in a body part being struck by a shifting, moving or falling object;
- 18 injuries involved employees using or adjusting equipment to perform tasks; and
- 4 cases were the result of dust and/or debris becoming airborne and striking an employee's eye.

To prevent these injuries requires proper work planning, identification of hazards and control measures, selection of proper tools/equipment, ensuring work surfaces and/or equipment are clean, performing work within controls, and maintaining an awareness of the location of objects and fixtures in the work area.

Electrical Safety – As noted in the 3rd Quarter Performance Analysis Report, in CY 2004 two assessments of the ANL-E electrical safety program have been completed and we continue to address the identified opportunities for improving our program. Attachment A contains two Safety Posters (Celebrate Safely and Electricity – The SHOCKING Truth) have been distributed to official ANL bulletin boards to enhance electrical safety awareness.

ESH/QA Event Quarterly Performance Analysis Report
Argonne National Laboratory
February 18, 2005

Background

The revised DOE ORPS Program was implemented at ANL on November 23, 2003. The revised system is intended to reduce nuisance reporting, clarify confusing reporting criteria, and place a new emphasis on periodic performance analysis.

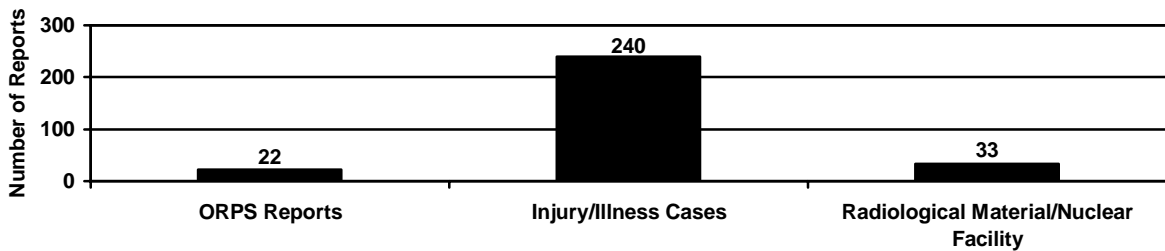
The purpose of the performance analysis is to ensure that recurring events are identified. Guidance concerning the identification and reporting of recurring events is provided in DOE Guide 231.1-1, *Occurrence Reporting and Performance Analysis Guide*. Events identified as recurring will be processed as a significance category “R” recurring occurrence report.

At ANL-E performance analysis is conducted quarterly and includes a review of ORPS and non-ORPS events/issues which have occurred during the previous 12-month period. The goal of the ORPS Quarterly Performance Analysis is to identify opportunities to improve ESH/QA performance and identify recurring/programmatic issues for further evaluation.

Incidents and Events Reviewed

Figure 1 presents the 295 incidents and events distributed by types of incident/event that were included in this performance analysis.

Figure 1 - Number of Incidents/Events Reviewed by Type

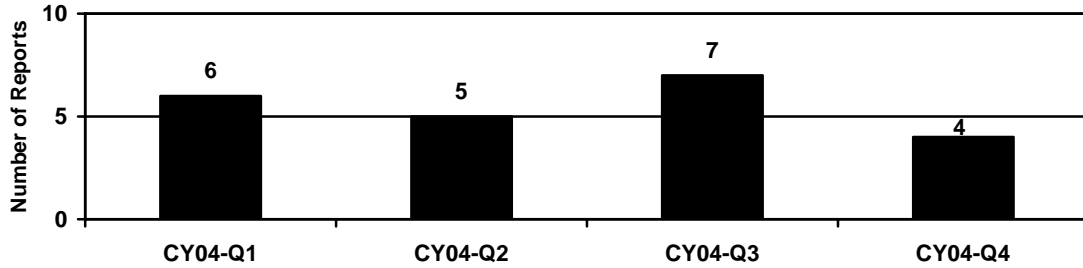


ORPS Report Review and Analysis

Number of ORPS Reports Submitted per Quarter

Figure 2 presents the distribution of the number of ORPS reports submitted by quarter for the period of January 1, 2004 to December 31, 2004. For the period, 22 ORPS reports were submitted and averaged of 5.5 reports per quarter.

Figure 2 - Number of ORPS Reports per Quarter

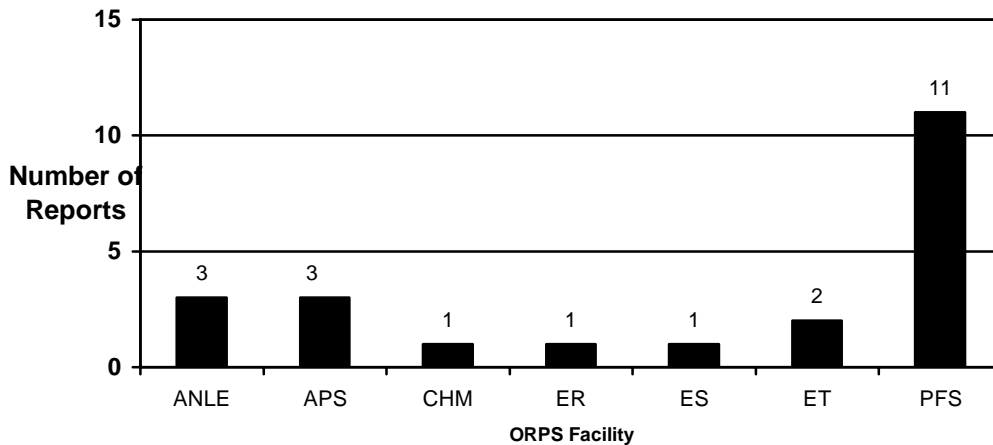


Conclusion: The above review of the number of ORPS reportable events by quarter did not identify any noteworthy trends or recurring events.

ORPS Reports by Facility

Figure 3 shows the distribution of ORPS reports by Facility for the twelve month periods of January 1, 2004 to December 31, 2004.

Figure 3 - ORPS Reports per Facility



The 11 ORPS reports for the Plant Facilities and Services were reviewed further. The 11 ORPS reportable events involved:

- Three events were related to personal injury;
- Two events were related to discovery of radioactive contamination;
- One event was related to improper lockout/tagout;
- One event was related to improper grounding;
- One event was related to inadequate control of radiological material;
- One event was related to improper design of a floor drain; and
- One event was related to improper use/operation of equipment.

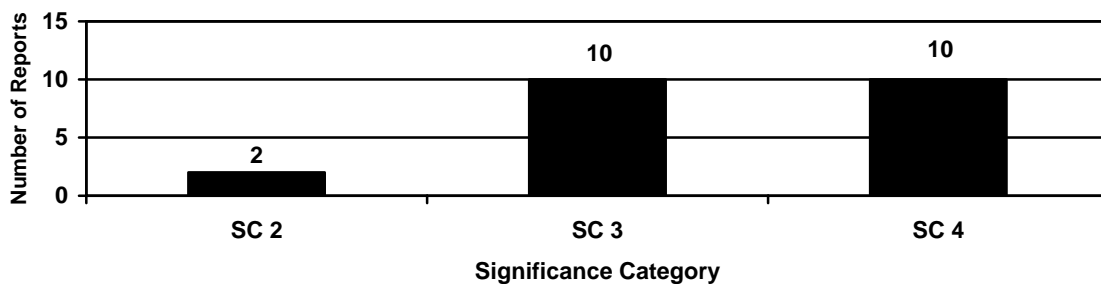
The analysis of the PFS ORPS reportable events did not identify any noteworthy trends or recurring events.

Conclusion: The review of the number of ORPS reportable events by Facility did not identify any noteworthy trends or recurring events.

ORPS Reports by Occurrence Category

Figure 4 shows the distribution of ORPS reportable events by Occurrence/Significance Category for the period January 1, 2004 to December 31, 2004.

Figure 4 - ORPS Reports per Occurrence/Significance Category



In CY 2004 the new ORPS was implemented, forty-five percent of the ORPS reportable events were Significance Category 4.

Conclusion: The review of the distribution of ORPS reportable events by Occurrence/Significance Category did not identify any noteworthy trends or recurring events.

ORPS Report by Reporting Criteria

Figure 5 shows the distribution of ORPS reportable events by Reporting Criteria for the period January 1, 2004 to December 31, 2004.

Figure 5 – ORPS Reports per Nature of Occurrence and Reporting Criteria

Reporting Criteria	CY 2004
2. Personnel Safety & Health	
2A(5) – Personnel exposure to chemical	1
2A(6) – Serious injury	4
2C(1) – Failure to follow prescribed hazardous energy control process	1
2C(2) – Failure to follow prescribed hazardous energy control process	1
4. Facility Status	
4B(5) – A facility event caused by deviating from procedure	2
4B(6) - A facility or operations shutdown	1
4C(2) – Suspect/Counterfeit and defective parts	2
5A - Releases	
5A(4) – Reportable release to the environment	1
6. Contamination/Radiation Control	
6B(3) – Onsite radiological contamination > 10 times total contamination levels	1
6B(4) – Onsite legacy contamination > 10 times total contamination levels	2
8. Transportation	
8(2) - Any offsite transport of hazardous material where the receiving organization initiates corrective action	2
8(3) - Any onsite transport of hazard material where the receiving organization's operations are disrupted	1
10. Management Concerns/Issues	
10(2) – An event that is a management concern	2
10(3) – A near miss	2

The review of ORPS Reportable events involving radiological and /or nuclear facilities was conducted using the PAAA review process and the results are provided in that section of this report.

Conclusion: The review of ORPS reportable events (excluding radiological material and nuclear facilities) by Reporting Criteria did not identify any noteworthy trends or recurring events.

Distribution by Cause Code

Figure 6 shows the distribution of ORPS reportable events apparent causes for the period January 1, 2004 to December 31, 2004.

Figure 6 – Distribution of ORPS Reportable Event Apparent Causes

Apparent Cause – A Level	CY 2004
A1 – Design/Engineering Problem	5
A2 - Equipment/material Problem	4
A3 – Human Performance Less Than Adequate	9
A4 – Management Problem	15
A5 – Communications Less Than Adequate	7
A6 – Training Deficiency	2

The review of ORPS reportable events by apparent cause resulted in further review of A4 – Management Problem and Figure 7 shows the distribution of Management Problem apparent causes:

Figure 7 – Distribution of A4 – Management Problem Apparent Causes

Apparent Cause – B Level	CY 2004
A4B1 – Management Methods Less Than Adequate	5
A4B3 – Work Organization & Planning Less Than Adequate	5
A4B4 – Supervisory Methods Less Than Adequate	3
A4B5 – Change Management Less Than Adequate	2

Seven of the twenty-two (33%) ORPS reportable events indicated Management Problem as apparent cause. A review of the seven ORPS reports showed:

- The APS laser eye injury event investigation identified six management problem apparent causes due to the principle investigator essentially working independently to align a Class 4 laser.
- Six of the seven ORPS events that identified management problem as an apparent cause were in four different departments of the PFS division.
- Continued management attention is needed to improve communication of management expectations and employee understanding of requirements and the importance of work planning, working within controls and supervisor responsibilities.

Conclusion: Management needs to continue its efforts to improve work planning, selecting qualified workers, identifying and analyzing hazards, developing and implementing control measures and conducting assessments to assure work is performed within controls. The review of ORPS reportable events by apparent causes did not identify any recurring events.

Injury/Illness Cases

For the period January 1, 2004 to December 31, 2004 there were 240 cases reported to the Medical Department. Of the 240 cases, 4 cases were submitted into ORPS, for 10 cases disposition is pending further evaluation, 46 are no-injury cases, and 45 are non-occupational injury/illnesses. This review examined the 139 first aid and OSHA recordable cases.

Organization Injury/Illness Cases

Figures 8 and 9 summarize the injuries and illness first aid and OSHA Recordable case distribution by ANL-E Organization for CY 2004.

Figure 8 - Total Cases for CY 2004

Case Type	SUF/APS	COO	AST/EEST	OTD	PBCS	Total
First Aid (reported)	10	45	7	4	18	84
DART	1	14	4	0	4	23
Days Away	1	6	1	0	2	10
Medical Treatment	4	4	4	3	7	22
Total OSHA Recordable Cases	5	18	8	3	11	45

Conclusion: The review of first aid cases and OSHA Recordable cases by organization did not identify any noteworthy trends or recurring events.

Body Part and Cause

Figure 9 presents the first aid and OSHA Recordable cases distributed by body part and action/cause of the injury/illness. It is important to note that for some actions/causes, multiple body parts may have been injured.

Figure 9– Distribution of Body Part Involved by Action/Cause of injury/Illness

Body Part	Action/Cause							Totals
	Fall/Slip	Overexertion or Strain; Awkward Movement	Repetitive Motion	Struck by or Struck against	Caught between	Contact with chemical, irritant, or physical hazard	Insect	
Head/Neck	1	2	1	8			4	16
Face				2			3	5
Eye				7			1	8
Respiratory Tract						1		1
Back	1	6		1				8
Trunk/Shoulder	6	4		1		1	1	13
Arm/Elbow	3	1	4	1		3		15
Wrist	1	1	3	2				7
Hand	1		1	5	2	9	1	19
Thumb/Finger			2	19	3	13	1	38
Leg/Hip	3	2		1				6
Knee	6	2						8
Ankle	4							4
Foot	1			1				2
Toe				3				3
Totals	27	18	11	51	5	27	14	153

Additional review/analysis was conducted of the 51 injuries caused by a body part (33% of all injuries) being struck by, or struck against, an object and the following observations were noted:

- 10 incidents involved a body movement that resulted in a body part striking an object. For example, a person standing up from a kneeling position and striking their head on a cabinet. Maintaining an awareness of the location of objects and fixtures in the work area and/or having a co-worker be a spotter will prevent these types of injuries.
- 8 incidents occurred during material handling that resulted in a body part being struck by a shifting, moving or falling object. To prevent material handling

injuries material moves should be planned, including identification of hazards and control measures, selection of proper equipment to perform the move, securing the load, and during the pre-task briefing employees should be reminded to not attempt to catch a falling load.

- 18 injuries involved employees using or adjusting equipment to perform tasks. In 5 cases the employee was injured when either the equipment being used slipped, or the equipment slipped and the employee struck their hand against a nearby object. In 1 case the employee was using the wrong tool for the job, i.e. a scissors to open a cooler. To prevent equipment use injuries it is important to select the proper equipment; inspect the equipment prior to use; identify other hazards in the work area, such as a sharp edge or object; and implement control measures.
- 4 cases were the result of dust and/or debris becoming airborne and striking an employee's eye. Three of the foreign particle in eye cases required medical treatment and are thus, OSHA recordable. Cleaning work surfaces and/or equipment prior to performing the tasks would have prevented these injuries.

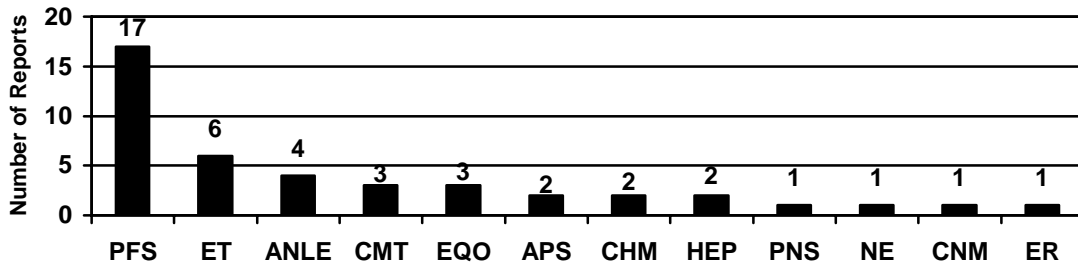
The 57 hand and finger injuries reported during the twelve month period account for approximately 37% of the total injuries. As reported in the CY 2004 3rd Quarter Performance Analysis Report, hand injuries also accounted for 37% of the total number of injuries and is consistent with industry experience. Recognizing that more needs to be done to prevent hand and finger injuries, management needs to continue attention in this area.

Conclusion: The review and analysis of injury/illness cases by ANL-E organization, body part involved and action/cause did not identify any recurring events. This review did identify two areas that need management attention. The first area is prevention of injuries resulting from a body part being struck by, or against, objects and fixtures. The second area needing continued management attention is prevention of hand injuries.

Radiological and Nuclear Facility Events

Figure 10 presents the radiological and nuclear facility events by division for the period CY 2004.

Figure 10 – Radiological and Nuclear Facility Event Reports by Division



During CY2004 there were 43 issues captured in the PAAA screening and review process. Forty-one (41) issues are completely through the process to disposition. Two issues remain in-process with ongoing investigation or information gathering. Significant investigation and root cause analysis were conducted by the alternate PAAA Coordinators for: two issues dealing with fire protection design and installation, two issues dealing with MC&A processes, an issue dealing with processing health physics instruments for disposal, and an issue regarding groundwater flooding of a partially below grade radioactive waste storage vault. In descending order the following divisions were associated with the PAAA issues in CY04: PFS (17, fourteen associated with WMO), ET (6), ANL-E as a site wide issue (4), CMT (3), EQO (3), APS (2), CHM (2), HEP (2), CNM (1), ER (1), NE (1) and PNS (1).

Two reports were made to the DOE National Tracking System (NTS) in CY2004 based on the results of the PAAA screening and review process.

Eight (8) of the 22 reports made to ORPS in CY2004 were captured in the PAAA screening and review process and are included in the above totals.

Conclusion: In July 2004, DOE-ASO and EQO ESH/QA professionals reviewed the previous fifteen months of incidents for trends and recurrence reportability. As a result of the July meeting, additional evaluation was conducted and a grouping of three events was determined to be NTS reportable (re: NTS Report # NTS-CH-AA-ANLE-ANLE-2004-0003, 09/21/04). No additional trends were identified through the remainder of CY2004.

Summary

The review and performance analysis of 295 incidents/events resulted in the identification of three trends that need continued management attention and no recurring events that require reporting into ORPS. The review and analysis of did not identify any recurring events.

The first trend identified is that thirty-three percent of the ORPS reportable events indicated an apparent cause of Management Problem. Management needs to continue its efforts to improve work planning, selecting qualified workers, identifying and analyzing hazards, developing and implementing control measures and conducting assessments to assure work is performed within controls.

The review of injury/illness cases by body part involved and action/cause did identified the other two trends that need management attention. The first area is prevention of injuries resulting from a body part being struck by, or against, objects and fixtures. The second area needing continued management attention is prevention of hand injuries.

Attachment 1 – Two Posters

Electricity the SHOCKING Truth

Celebrate Safely

ELECTRICITY

the  **SHOCKING** truth

Electricity is a partner we too often take for granted. It's everywhere. We use it every day. Because it is so familiar, we forget its dangers and risks.

Most of the electricity-related deaths and injuries arise from:

- Work near overhead power lines.
- Contact with underground power cables during excavation.
- Work on or near 220 volt domestic power supplies.
- Use of unsuitable electrical equipment in explosive areas.



General electrical safety

- Look up, down, and around.
- Look for electrical wires, cables or equipment.
- Check for electrical warning signs.
- Use only qualified electrical workers to repair or install electrical devices.
- Install GFCIs on outlets near water and test them regularly.
- Check wires, cords and plugs for damage regularly.
- Toss frayed extension cords.
- Use extension cords wisely
 - the right size, for temporary use only and one cord for a job.

Electricity **kills** and **injures** people.
Around **1000** electrical accidents at work are reported each year.
About **30** people die of their injuries.

In the Lab

- Use only qualified personnel and approved procedures for hot work.
- Assure that electrical equipment is suitable for work and electrical supply.
- Know how to use the proper PPE.
- Identify hazards before work starts (including electric shock, burns, and ignition of explosive atmospheres).
- Keep corrosive and organic chemicals away from cords.
- Keep flammable material away from electrical equipment.
- Keep electrical panels unobstructed.
- Know how to de-energize all equipment in case of emergency.
- Get an up-to-date map of the electrical services in the area and use it.

In the Office

- Don't set coffee or soft drinks near electrical equipment.
- Don't run cords under mats, carpets or through doors.
- Don't use a power strip as an extension cord.
- Don't overload an outlet.

At Home

- Keep appliances away from sinks and tubs.
- Teach kids how to use electricity safely.

Outdoors

- Don't assume black coating on wires is insulation.
- Don't let kids climb trees or fly kites near power lines.
- Don't disguise transformers or meters; they must be located easily in an emergency.
- Don't trim trees near power lines; let the public utilities do it.
- Call JULIE (1-800-892-0123) before you dig.



Electrical Safety IQ Test

1. Is it safe to run cords under carpets?
2. How many sets of holiday lights can be strung together safely?
3. Can normal household electricity hurt you?
4. Are all overhead wires insulated?

Answers
1. No 2. Three 3. Yes 4. No



* Celebrate Safely *



Gifts ideas that can save lives

Put together a safety gift basket of one or more of the following:

- Three smoke detectors and quality fire extinguisher.
- A flashlight and batteries or light sticks.
- A first-aid kit.
- A carbon monoxide detector.
- A mobile phone.
- A second floor escape ladder.

Candles are important in the celebrations of Advent, Christmas, Hanukkah, and Kwanzaa. Don't let the beauty of holiday candles blind you to their hazards.

As the holidays approach, each of us has an excellent opportunity to look for

Holiday safety tips

Decorations

- Use only non-combustible or flame-resistant materials to trim a tree.
- Never use lighted candles on a tree or near evergreens.
- Always place candles where they won't be knocked down.
- Always use holiday lights tested by a recognized testing laboratory - indoors or outdoors.
- Make sure outdoor lights are certified for outdoor use.

Fireplaces

- Never burn wrapping paper in the fireplace - flash fires may result as wrappings ignite suddenly and burn intensely.
- Never burn branches from live trees in the fireplace.

and eliminate potential dangers that could cause fire and injury. A little prudence and planning can prevent wonderful traditions from becoming holiday tragedies.



Trees

- Look for the label "fire resistant" when purchasing an artificial tree.
- Place away from fireplaces and radiators.
- Use only lights that have fused plugs.
- Use no more than three standard-size sets of lights per single extension cord.
- Check lights for broken or cracked sockets, frayed or bare wires, or loose connections.
- Never use electric lights on a metallic tree.
- Turn off all lights when you go to bed or leave the house.

DID YOU KNOW ...

- that hospital emergency rooms treat over **10,000** holiday injuries
- that **11,000** candle-related fires are started (**150** deaths and **1200** injuries)
- that Christmas trees cause **400** fires (**20** deaths, **70** injuries, and **&15 million** in property loss
... **EVERY YEAR?**)

"A little prudence and planning can prevent wonderful traditions from becoming holiday tragedies"



Look for the label "**fire resistant**" when purchasing an artificial tree.



From ANL-E and
EQO division

Have a safe holiday!

