



ZODIAC POOL SYSTEMS, INC.

# Product Safety & Compliance



# Discussion Topics

- Product Liability in the Americas
  - Examples of National Court Verdicts
  - Recent liability cases in the news
- Product Safety Program
  - Overview of an example – Zodiac Pool Systems, Inc.
  - Why Focus on Safety & Compliance?
  - Product Documentation and WARNINGS
  - General Compliance Facts



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## US Court Verdicts

(some data provided by NJL)

<u>Year</u>	<u>State</u>	<u>Manufacturer</u>	<u>Injury</u>	<u>Verdict</u>
1993	Florida	Withheld	1 death	\$900,000.00
1993	Wisconsin	Withheld	4 deaths; 1 vocal cord damage; Short-term memory loss	\$1,007,400.00
1991	Michigan	Withheld	1 death (child)	\$1,250,000.00
2004	Texas	Withheld	1 death, 1 injury	\$2,000,000.00
1999	Illinois	Withheld	1 brain injury	\$3,515,000.00
2003	Michigan	Withheld	2 deaths, 2 injuries	\$25,691,000.00
2007	Alabama	Withheld	1 death	\$50,000,000.00
2003	Wisconsin	Withheld	Permanent brain damage	\$104,000,000.00



## More Recent and Current Product defect/liability cases in the media

- Ford/Firestone – (2000)

- Issues:

- Tread Separation problem on Firestone tires; primarily on tires mfd. at Decatur, IL factory.
    - Failure in manufacturing process control at factory.
    - Rollover incidents in Ford Explorer models (and brand twins) from 1991-2000
    - Failure to test product properly during product development

- Ramifications:

- 103 deaths “linked” to Ford/Firestone combination.
    - 2200 injuries connected to the Ford/Firestone combination
    - Estimated \$1B legal costs.
    - Significant loss in market share for Firestone in 2000 from 21% down to 4%.
    - Loss of customer confidence in both firms.
    - Accusations of hiding the truth after knowing a problem existed in various parts of the world.





## More Recent and Current Product defect/liability cases in the media

- Toyota Motor Corporation
  - Sudden Unintended Acceleration (SUA)
    - Faulty mats?
    - Faulty electronics?
    - Sticking accelerator linkage
    - Failure of proper DFMEA?
    - Failure to properly qualify products?



**TOYOTA**

– Ramifications:

- Now linked (by firms like “Safety Research and Strategies, Inc”) to the following allegations:

### Toyota Unintended Acceleration Incidents, Reported from 1999 to the Present

Incidents	3306
Crashes	1159
Injuries	469
Deaths	39



## More Recent and Current Product defect/liability cases in the media

### – Ramifications:

- 8M+ cars recalled worldwide
- \$5.5B loss estimated in current financial year BEFORE calculating costs of recall in 2010.
- Recall alone could cost up to \$2B
- Lost market share in an already troubled economy
- Significant “hit” in customer confidence
- Factory shutdowns
- Layoffs





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## As a Leading Manufacturer:

- How Does one address the ever-increasing risk of suffering product-liability issues?





# Be a Responsible Manufacturer

- Establish and implement -:
  - an effective strategy/program to ensure Product Safety and minimize litigation.



# Example:

## Zodiac Pool Systems, Inc. Product Safety Program

- Based on a **Product Safety Policy**
- Led by the **Product Safety Council**



# Product Safety Council

## The Product Safety Council's primary responsibilities are to:

- Establish all Company policies and procedures related to product safety.
- Drive risk assessment and hazard analysis for new and existing products and practices.
- Regularly review product allegations and claims to identify and implement the appropriate corrective action.
- **Minimize** Company's exposure to product liability issues.



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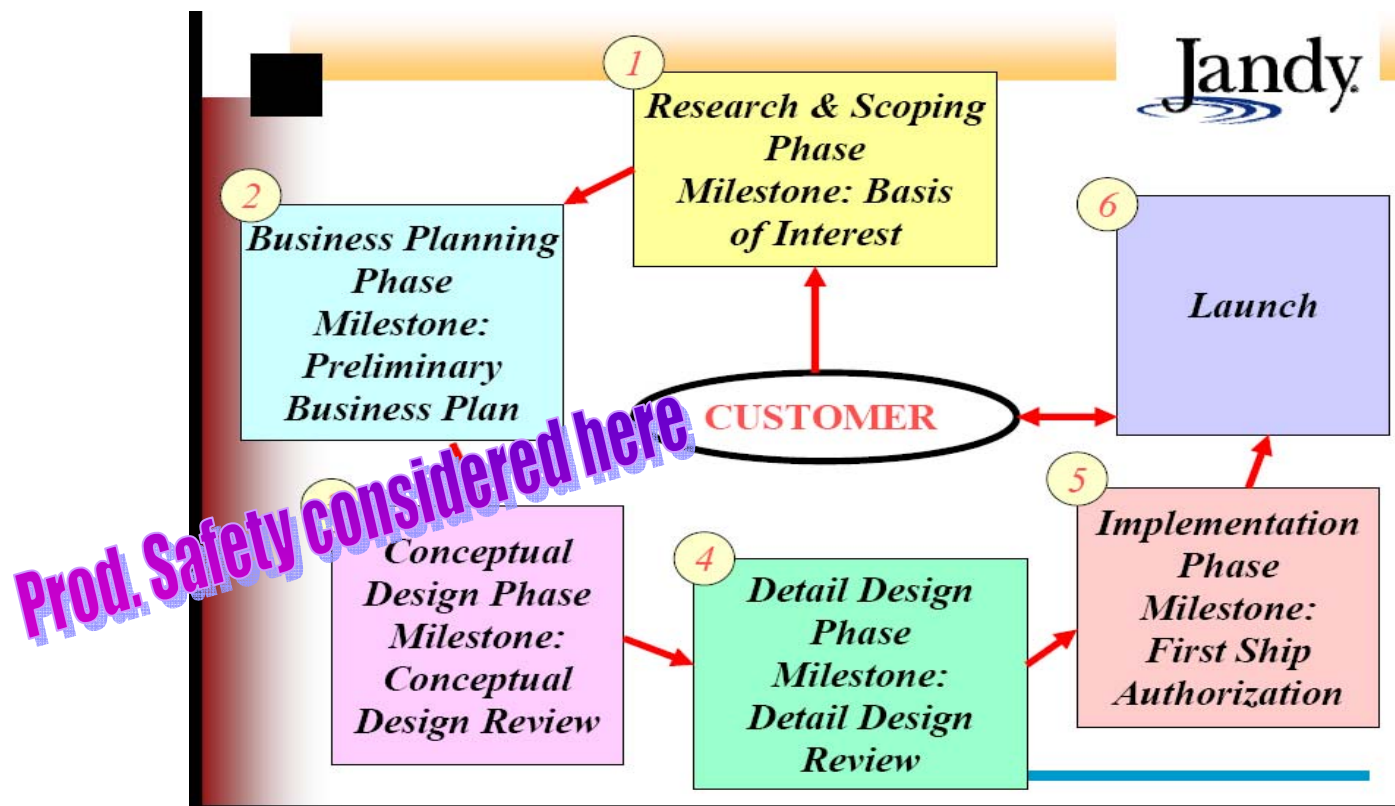


# Safety & Compliance – Integral part of NPD process

- Product Safety and regulatory compliance should NOT be an “afterthought”
- Product Safety and Compliance is focused upon early in the NPD process
  - During “Conceptual Design Phase/Review (CDR) and Detailed Design Phase/Review (DDR)”



# Safety & Compliance – Integral part of NPD Process





# Product Safety Council

- Involved in all stages of a product's life –
  - product concept
  - product development
  - product sales
  - product service and support at customer site





# Product Safety Program – Fundamentals

PSC also involved in development of product manuals and Service Bulletins:

- Technical Writing of manuals, product literature, bulletins, etc is reviewed/overseen by Product Safety & Compliance team.
  - **Instructions and Warnings** – All labels meet or exceed applicable regulatory standards (e.g. ANSI Z535 series) and they warn of misuse.
  - **Manuals**, before being finalized & released, are subjected to a detailed review by a Document Review Board (DRB) consisting of members from engineering, marketing, production/operations, and the PSC. Among others, the following items are considered during the manuals development process:
    - Compliance of the manual with applicable product safety codes – e.g.: ANSI Z21.56; UL 1563; UL 1995; UL 676; NSF-50; UL 1081;
    - Proper CAUTION/WARNING statements to instruct installer and consumer on hazards that can arise due to improper installation and usage of the product;
    - Ease and accuracy of assembly and/or installation instructions;
    - Inclusion of all necessary conditions such as gas supply, water flow, ventilation, environmental conditions, electrical connections, etc... for proper and safe operation of the product.
  - **Field & Service Bulletins**
    - Are issued in the event that any safety or serious quality issues are identified as existing on any product.
    - Are logged and controlled by bulletin number





# Product Safety Program - Fundamentals

Policies and Procedures have been established for:

- **Incident Reporting** – Procedures and systems exist to address
  - consumer feedback,
  - product abuse/misuse,
  - product liability claims.
- These matters are reviewed periodically:
  - Service Managers' meetings,
  - Quality review meetings,
  - Warranty reviews.
- Trends and potential problems are identified and acted upon.
- All serious incidents are immediately investigated on site by a multi-disciplinary team, typically including an outside expert witness, an outside products liability attorney, a senior Company design engineer and a Company field service representative.
- **Product Recall** – A formal products recall procedure is in place. This procedure allows traceability of date and place of manufacture of a product. Critical components used in products are also coded and traceable.



# Product Safety Program – Claims Handling

- Claims Handling
  - A structured procedure to address claims involving personal injury or property damage has been implemented;
  - The procedure dictates the formation of three types of claims handling response teams – “A”, “B”, or “C”. The type of team and its members are driven by the following factors:
    - Level of personal injury involved in claim – none, minor, or serious;
    - Level of property damage involved in claim – minor, substantial, or very substantial.



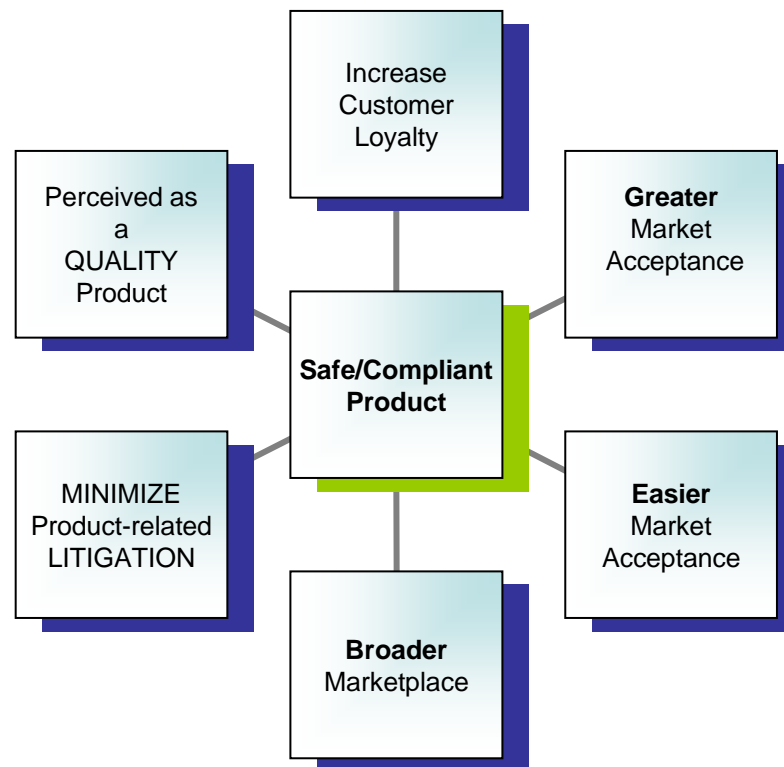
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# Why Focus on “Product Safety” & “Compliance”?





# Why Focus on “Product Safety” & “Compliance”?





# Why Focus on “Product Safety” & “Compliance”?

- While the benefits of a Safe/Compliant product include:
  - Increased sales and profits
- Minimizing Product-Related Litigation can mean the difference between keeping a business or losing it.
  - Juries in North America award very large \$\$\$ amounts to plaintiffs



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# Why Focus on “Product Safety” & “Compliance”?

Friday, August 8

Sta-Rite

The Busi

St

\$104 million suit

Pete Millard

\$104 million lawsuit in Miami for a faulty suction pump

a Sta-Rite single-horsepower pump was  
underwater for several minutes. The incident caused  
age. He now lives in a permanent vegetative state and is

Miami, Fla., claimed in its lawsuit that the pu  
modify the design to make it less dangerous or t  
sed for swimmers, said Michael Haggard, the Mia

Sta.  
manu.

"This was a tragic accident," said  
"While our primary focus is how a young man we're disappointed  
with the jury decision and are reviewing it."

Peterson was the 21st person to be  
Several of the lawsuits were in  
SwimQuip in 1980. Peterson  
encountered as a result of

In 1997, a Raleigh, N.C.,  
then 9-year-old Val  
wading pool and  
candidate, was

Also in 1997, a Raleigh, N.C.,  
recalled 135,000

Lawyers for Peterson  
punitive award is ha  
insurance companies.

Baldwin Co. jury awards \$50 million in faulty water heater suit

10/19/2007, 10:48 a.m. ET  
The Associated Press

BAY MINETTE, Ala. (AP) —  
killed wh

'There's no brakes... hold on and pray': Last  
words of man before he and his family died in  
Toyota Lexus crash

...water heater in his  
...Krantz's widow, Michelle Krantz, hugged her father, Jack Holton, who had  
...death trial from the front row. They wept along with their attorneys.

a lawyer for A.O. Smith, told the ...-Register for a story Friday he was "absolutely  
award and expects an ap

Krantz lawyer Joseph M  
large manufacturing  
prayer and told jurors that the large  
expose them, bring them to their

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# Why Focus on



**! DANGER**

**LAWYER OPPORTUNITY ZONE**

Failure to have perfectly adequate warnings that anticipate every possible hazardous situation, no matter how remote, will result in litigation by hordes of lawyers who will make even the most innocent thing appear to be malicious willful intent by your company to cause great harm to their client, and will leave you penniless and broken after wasting immense amounts of your time.

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11.30.2005 08:22



# Safety & Compliance – Many Standards apply

- CODES, STANDARDS, DIRECTIVES -
  - Identify, acquire, and review applicable Safety and regulatory standards, codes, and directives
  - Ensure standards are accessible to team –
  - Be familiar with critical requirements of the standards
- UL
- CSA
- EN
- SCAQMD
- ASHRAE
- ASTM
- ANSI
- AS
- NZ
- NOM
- LVD
- GAD
- EMC Directive
- MEA
- Mass Plumbing Board
- Etc.....





# Safety & Compliance – Pre-Certification Testing

- Pre-Certification Qualification & Testing –
  - Incorporate “pre-certification” testing as part of the Qualification Test Plan (QTP).
  - Components and materials should be chosen in accordance with regulatory standards guidelines. A Materials Info. Form (MIF) may be used to detail/list all critical components and their/critical relevant details.
  - Helps ensure compliance when submitted to the regulatory testing agency.



# Safety & Compliance – Pre-Production Safety Review

- Preliminary Safety Review
  - Identifies key elements needing completion before First Ship Authorization (FSA)
  - Assigns actions to appropriate personnel from Engr., Ops., Quality., Marketing., etc...
- Final Safety Review
  - Ensures all actions Id'd during preliminary review are indeed completed with documented completion

## Pre-Production Product Safety Review

Project: LX-I Heater

Attendees: Emily Colomes; Chris Hertzberg; Jaime Benavides; Bob Sforzini; S. Siddiqui			Date: 7-24-07
Items for Review	Review Observations	Status	
Agency Certification:	Eval. & Testing complete - No safety issues found.	Complete	
Labels are visible and understandable	All labels and scheme identified - Will use scheme and labels very similar to existing LX-series heaters	Complete	
Label locations defined and available for manufacturing	Label sheets and scheme completed. Very similar to existing LX-series heaters	Complete	
Serial Number Scheme defined and implemented	Scheme has been defined -- Will continue to use current Moorpark format	Complete	
Final Test Procedure approved by Engineering	FIT complete. Method sheet format complete	Complete	
ICM Manual released	Complete	Complete	
User's Manual released	Part of ICM	N/A	
Training Planned and Implemented according to schedule	Pete Owens has developed plan and schedule	Complete	
Mechanical Hazards: with sharp edges or burrs	Contact Hex head screws can cause very MINOR abrasion potential - Not deemed hazardous	Complete	
Electrical Hazards: Contact with live parts	Electrical enclosure is quite close to front edge of heater. Investigate further protecting live parts from water intrusion and from inadvertent contact. - Will extend front fill voltage barrier towards front of unit to further hinder inadvertent contact with any live voltage non-insulated parts. MUST add additional gasket material to prevent water intrusion.	Complete	
Qualification Test Plan Results	All results are acceptable final report being compiled and pending - Engrng okay to move forward based on results	Complete	
Beta test results documented. Major failures identified and addressed	BETA Testing is On-going - All issues to date have been considered and addressed. Engr. okay to move forward. Report from Engr is being compiled	Complete	
Foreseeable Use or Misuse	Unit is fixed and of substantial size. Any potential for misuse was addressed in DFMEA.	Complete	
Potential Failure Modes, hazards, causes and actions required to prevent them (Run away condition, power failure, valve failure)	DFMEA conducted to address potential issues	Complete	

Shajee Siddiqui

Digitally signed by Shajee Siddiqui  
DN: cn=Shajee Siddiqui, o=Zodiac Pool Products, Inc., email=ssiddiqui@zodiac.com  
Reason: I am approving this document  
Date: 2007.07.25 11:24:18 -0700



# Safety & Compliance – Serviceability Review

- Preliminary Service Review
  - Identifies any serviceability-related issues needing attention.
  - Involves engr., ops., safety, and service staff.
  - Assigns action items to appropriate team members to complete before final Service Review
- Final Service Review
  - Ensures that all open items from preliminary review are completed.

Preliminary Product Design / Service Review				
Project: UltraLite Pool Heater				
05/24/06 Attendees: Emily Colomes, Pete Owenson, Dave Nibler, Tim Summers, Fernando Avila, Arturo Torres, Tony Cruz, Kevin Williams, Angel Paramo, Dave Varnon, Chris Hertzberg, Carlos Castro, Aurelio Flores				
01/17/07 Attendees: Emily Colomes, Pete Owenson, Tim Summers, Arturo Torres, Angel Paramo, Chris Hertzberg, Jaime Benavides, Curt Spivey, Leo Meza, Brett Davis, Mike Kimball, Keith McQueen, Bob Rapp				
08/09/07 Attendees: Emily Colomes, Tim Summers, Jack Zurich, Steve Intres, Art Lincoln, Tony Cruz, Dick Carroll, Alex Krajewski, Mike Lucas				
Items for Review	Review Observations 08/24/06	Review Observations 01/17/07	Review Observations 08/09/07	Status
Installation				
Prepping for install - positioning product, etc	Need some mechanism for 1 person to be able to install a 400 - either handles of some sort or wheels, etc.	Same	Hot Wheels killed by Safety Committee, but UltraLite is much lighter than current Lite2	N/A
		Overall height is about 1/2" taller than current Laars Lites, but that shouldn't be a problem if installed with vent cap / draft hood - can just cut vent pipe.	Same	
Ease of taking doors, panels off, etc	Door latch is good, only 2 screws required to remove top is great!	Same, except 4 screws to remove top	Same	
Plumbing ease - access to fittings	Concern about new distance between in/out locations. Spacing was enlarged to accommodate Universal Unions, but some areas used copper plumbing straight from cement	Still an issue - 3/8 difference will affect ease of installation. What about using existing LX unions? Since they are smaller, distance can be the same as it is today. They also cost less than the Universal Unions.	Spacing will not be a problem.	
Plumbing ease - right/left side	Heat Exchanger reverse - plumbing needs to be reversible either by flipping the entire heat exchanger, or by reversing	Looks good - can reverse HX using either method.	Same	
Electrical - wiring diagram accessible	Will either be on the door or on the inner panel - location will be cool enough for the label material and adhesive	Same	Same	Determine final location
Electrical - location of connections	Wiring needs to be connectable from either side of the heater (knock-out on left side), height of electrical connection on right side needs to be same as current models	Wiring connections on this version look good.	Same	
	Being able to check the continuity of the water pressure switch is important - if possible from the main component compartment.	Not necessary from main component compartment. Checking / replacing the pressure switch on the LX beta units has not been a problem - ok as is.	Pressure switch will be accessible from main compartment, will not affect any other component if it leaks.	
	For training purposes and for ease of trouble-shooting, try to keep electrical wiring to 3 loops: high limits, fusible link, press switch	Done on LX - wiring scheme will be similar	Complete	
Electrical - ease of connecting	Same as existing - 120/240 convertible, will be wired for 240.	Same	Same	



# Safety & Compliance – Product Certification

- Initiate, Manage, and DRIVE regulatory compliance projects –
  - targeted towards achieving market driven and jurisdictionally required product certifications
- Interface with regulatory bodies –
  - to properly understand, interpret and meet applicable requirements
- Engage in healthy discussions, and debates if necessary, with agencies –
  - to ensure that your products are not “excluded” from scopes of regulatory requirements
  - i.e., ACTIVE participation to ensure a “Level playing field”
- ETL SEMKO, UL – for global electrical product safety certifications;
- CSA, BSi, AGA – for global gas-products certifications
- FCC – certification for RF emissions
- SCAQMD – for combustion emissions regulations
- Various state, county, city regulatory bodies regulating health, emissions, energy efficiency, product installation, etc.
- EPA
- Many Others...



# Document Generation – Review/Approval

- Document Review Board (DRB)
  - Integral part of the Documentation process
  - All product-related manuals, literature, labels, and boxes/cartons are reviewed by the DRB
  - DRB consists of key members from
    - Engineering
    - Operations
    - Service
    - Manufacturing
    - Quality
    - Safety/Compliance
    - Legal
    - Marketing



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# Proper review of docs. & labels is Important







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Users of our products vary widely,  
therefore docs should be CLEAR





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# Zodiac Pool Systems, Inc



Selecting proper  
Product Safety  
**Warning**  
SIGNS AND LABELS







# Safety & Proper WARNINGS

## Integral part of NPD process

### Inadequate Warnings –

- Found to be one of the leading causes of product liability lawsuits for at least one major insurance company



# Safety & Proper WARNINGS

## Integral part of NPD process

Just as the design of products with the latest safeguards is critical –

- So too are the WARNINGS and instructions associated with the products.



# Safety & Proper WARNINGS

## Integral part of NPD process

Plaintiffs look for opportunities to challenge:

- the adequacy of WARNINGS
- the conspicuousness and placement of the WARNINGS



# Safety & Proper WARNINGS

## Integral part of NPD process

### EXAMPLE -- Lakey vs. Mfg. of pool drain cover:

- 5-yr old Valerie Lakey dis-emboweled due to missing/broken drain cover in pool
- Lakeys sued the Club (pool), County, pump mfg., and drain cover mfg.
- Club, pump mfg. and County settled with Lakeys for total of \$5.9M
- Settlement against cover mfg. for “FAILURE to WARN” -- \$25M

**\$31 MILLION**



# Safety & Proper WARNINGS

## Integral part of NPD process

### EXAMPLE -- Marcon vs. K-Mart:

**\$8 MILLION**

- 12-yr old boy thrown from a snow-sled while riding it on his knees
- Becomes quadriplegic
- Sled manufacturer out of business
- Jury finds K-Mart Corporation (seller) liable for “FAILURE to WARN”
- \$8 Million



# Safety & Proper WARNINGS

## Integral part of NPD process

### EXAMPLE – Zodiac Case:

- Pool heater
- alleged high levels of Carbon Monoxide (CO) led to fatality
- Product clearly installed and vented incorrectly
- Plaintiff pursued “FAILURE to WARN”
- Zodiac/Jandy staff deposed
- Potential \$10 Million case – settled favorably since Zodiac was PROACTIVE and WELL-PREPARED

**\$10 MILLION**



# Safety & Proper WARNINGS

## Integral part of NPD process

It is a Legal Duty To Warn  
(Third Restatement of Torts)

A Product can be considered “DEFECTIVE” if WARNINGS and INSTRUCTIONS accompanying the product do not apprise consumer of foreseeable risks involved with the use of the product.





# Safety & Proper WARNINGS

## Integral part of NPD process

- Product Safety and PROPER hazard WARNINGS should NOT be an “afterthought”



# Safety & Proper WARNINGS

## Integral part of NPD process

Adequate instructions & WARNINGS/CAUTIONS must be:

- Included on the product
- In manuals and all relevant product documentation
- Technical/Service bulletins
- R-kit instructions
- Etc...



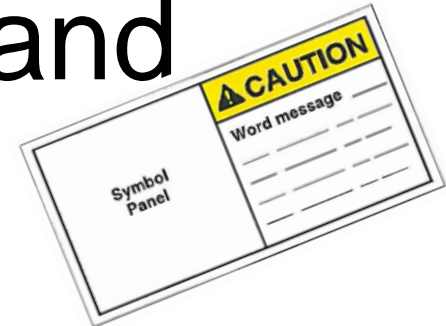
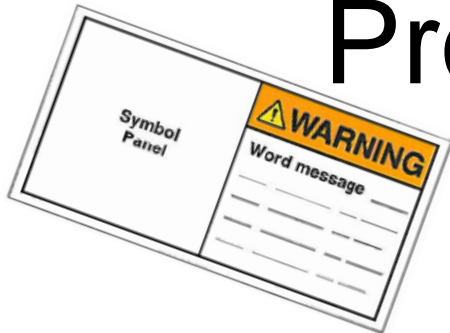
# Proper CAUTIONS and WARNINGS

## How to develop them?

- May be specified by applicable regulatory product safety codes & Standards
- Based on Industry accepted standards – e.g., ANSI Z535 – series
- Go directly to ANSI Z535.4 when regulatory product standard does not have any specific requirements.



# Proper CAUTIONS and WARNINGS



## Key parts of an effective Safety Sign or label:

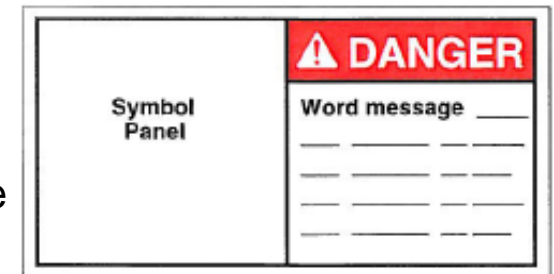


- **Signal Word** – “NOTICE”, “CAUTION”, “WARNING”, “DANGER”

- Signal word may or may not need to be accompanied by the **“safety alert symbol”**

- **Word Message** – Communicates info. to the observer:

- Type of hazard
  - Consequences of not avoiding the hazard
  - How to avoid the hazard
  - Must be as CONCISE and CLEAR as possible



- May or may not have a “symbol panel”



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# Signal Words – ANSI Z535.4 definitions



**DANGER** indicates a hazardous situation which, if not avoided, will result in death or serious injury.



**WARNING** indicates a hazardous situation which, if not avoided, could result in death or serious injury.



**CAUTION**, used with the safety alert symbol, indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.



**NOTICE** is used to address practices not related to personal injury.



**CAUTION**, used without the safety alert symbol, is used to address practices not related to personal injury.



# Proper CAUTIONS and WARNINGS

## Which Signal Word to use?

- Conduct a **Risk Estimation**
  - Annex E of ANSI Z535.4 gives guidance on “RISK ESTIMATION” to help determine which signal word to use



# Risk Estimation Model

## ANSI Z535.4

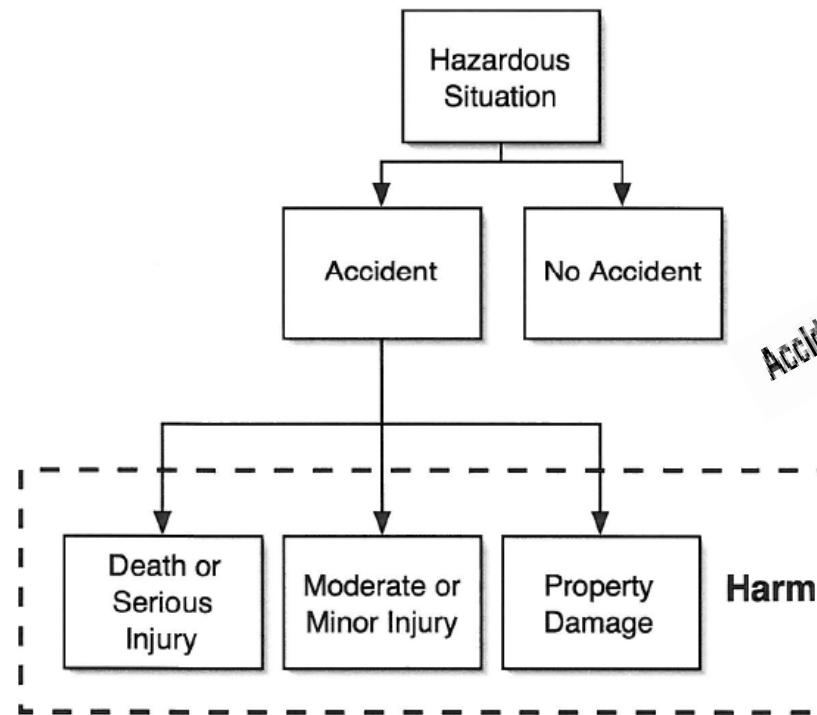


Figure E1 – Model of the possible results of a hazardous situation

*Accident: An incident that results in unintended harm.*

*Harm: Death, injury or property damage.*





# Signal Word Selection - ANSI Z535.4

## E4.2 Signal Word Selection Process

The signal word selection process is summarized in Figure E2.

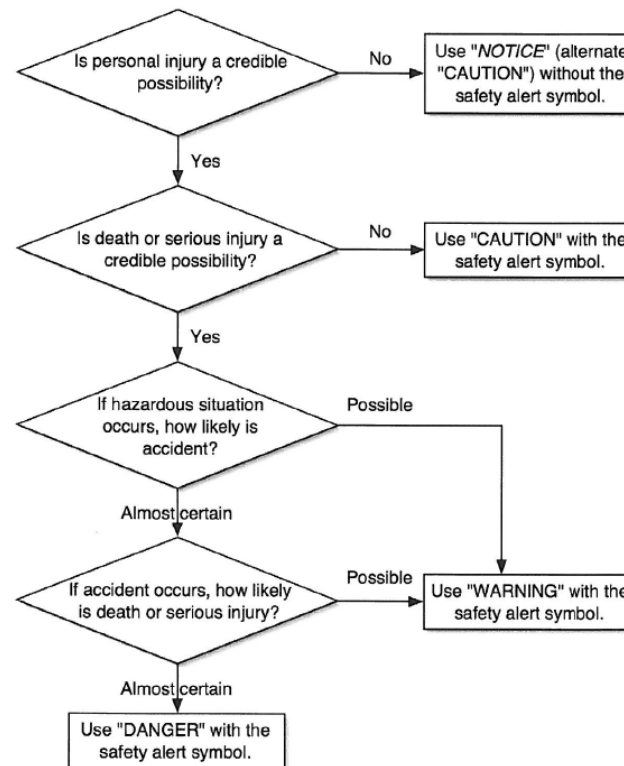


Figure E2 – Signal word selection process



# Signal Word Selection - ANSI Z535.4

If Worst Credible Severity of Harm is Death or Serious Injury

		Probability of Accident if Hazardous Situation is not Avoided	
		Will	Could
Probability of Death or Serious Injury if Accident Occurs	Will		
	Could		

If Worst Credible Severity of Harm is Moderate or Minor Injury

For all probabilities:	
------------------------	--

If Worst Credible Severity of Harm is Property Damage

For all probabilities:	Preferred: 
	Alternate: 



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To summarize



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## Effective Product Hazard Warnings:

- DO NOT mean that a product is “inferior” in any way
- Are LEGALLY REQUIRED
- Indicate that the manufacturer is a RESPONSIBLE one and is concerned about the CONSUMER’S SAFETY and well-being



## Effective Product Hazard Warnings:

- Should be based on accepted standards, such as: ANSI Z535.4
- Require a Hazard Risk Estimation
- Have the proper Signal Word included
- Include the Safety Alert Symbol, when needed.
- Are Clear & Concise



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# GENERAL COMPLIANCE FACTS



# General Compliance – Pool Products

- There are many compliance requirements – dependant upon, and often different for:
  - Type of product
    - Heater
    - Control
    - Light
    - Filter
    - Pump
    - Pool Cleaner
    - Water Treatment (Chlorine Generators, Nature2, etc...)
  - its intended market
    - Country
    - State
    - Province
  - its function.





# General Compliance – Pool Products

- Once again, “Why Comply?”
  - Be a responsible manufacturer
  - Make “safe” products
  - Req’d by Authorities Having Jurisdiction (AHJ’s)
    - City, County Inspectors
  - Minimize Risk & Liability



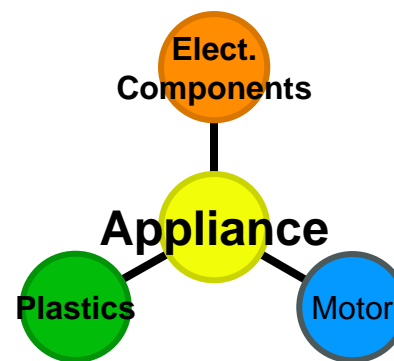
# General Compliance – Pool Products

- There are regulatory standards for “end-products” and for “components”
- Generally, our products are considered “end products” because they are “complete” or can “stand alone”.
- “Components” are parts used to make the “end product”. Examples of components:
  - Switches/relays,
  - Transformers,
  - Motors,
  - Plastics, and
  - Gaskets/sealing materials



# General Compliance – Pool Products

- Use of listed/certified components ensures easier path towards compliance and certification of end-products
- Helps minimize end product manufacturer's responsibility/liability for the component.





# General Compliance – Pool Products

- Electrical Product Standards applicable to pool products include, but not limited to:
  - UL 1563 – US “Standard for Safety for Electric Spas, Equipment Assemblies, and Associated Equipment”
  - UL 1081 – US “Standard for Safety for Electric Swimming Pool Pumps, Filters, and Chlorinators”
  - UL 676 – US “Standard for Safety for Electric Underwater Luminaires and Submersible Junction Boxes
  - CSA C22.2 No. 218.1 – Canadian Electrical Safety Standard for “Spas, Hot Tubs, and Associated Equipment
  - EN60335-1 & EN60335-2-41 – European National standards for Pumps
  - EN60598-1 & EN60598-2-18 (AS/NZ 60598-2-18) – European National Standards for Underwater Luminaires (Australian/New Zealand version)
  - Many others...



# General Compliance – Pool Products

- Gas Product Standards applicable to pool products include, but not limited to:
  - ANSI Z21.56 – Safety of “Gas-Fired Pool Heaters”
- Sanitation standards applicable to pool products include:
  - NSF-50 – “Circulation system components and related materials for swimming pools, spas/hot tubs”
- Environmental Protection Agency (EPA) rules
  - For Chemical products



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# COMPONENT COMPLIANCE



# Components - Compliance

Remember –

- Use of listed/certified components ensures easier path towards compliance and certification of end-products
- Helps minimize our responsibility/liability for the component.





# Components - Compliance

## Critical Electrical Components –

- Transformers;
- Motors
- Switches/Relays/Contactors
- Wiring
- Fuses/Circuit Breakers
- Generally anything operating at over 24Volts
- Gaskets/Seals/Plastics – used to protect electrical components from the environment.



# Components - Compliance

## Critical Gas Components –

- Transformers;
- Ignition controllers
- Gas Valves
- Regulators
- Temp. limit controls/switches
- Heat Exchanger materials



# Components - Compliance

- Critical components should be listed/certified by an ACCEPTABLE TESTING AGENCY (Certification Body/ NRTL) as being compliant with applicable component standards.
- Components can also be “Recognized”. This means that they have been evaluated, tested and found to comply with the essential requirements of the applicable standard but may have certain “conditions of acceptability”.
- Beware of Components sold/marketed as
  - “tested to UL Standards” -- By Who?
  - or “meets UL standard...” -- Says Who?
  - “UL approved” -- By Who?



# Components - Compliance

Standards applicable to critical components used in Pool Products:

– **Transformers** –

- UL 506 & CSA C22.2 No. 66 – “Specialty Transformers” - generally applies to “small ‘power’ transformers”
- UL 1585 – “Class 2 & Class 3 Transformers” – generally applies to “current-limited” or “low-voltage” transformers such as control transformers.
- NEW UL standard for x-frms – UL 5085-1 and associated sub-parts. Replace the above older standards
- IEC 61558-2-6 – European standard for Safety Isolating Transformers; Usually needed for transformers used in products destined for European Union (EU) for CE compliance.

Check with Compliance staff to confirm which standards need to be met for a particular application.



# Components - Compliance

## Critical components used in Pool Products:

- Gaskets/Seals, when used to protect electrical components from the environment:
  - UL 157 – Standard for Safety for Gaskets and Seals
- Always make sure you get proof from vendor to demonstrate that the material is “Listed”, “Certified”, or “Recognized” by a NRTL.
- Example of “proof” is the “UL Yellow Card” – listing as it appears in the UL Directory;
- You can also get the UL File No. which we can use to verify listing.
- If product is “Recognized”, we should also get the “Conditions of Acceptability” from the Vendor.



# Components - Compliance

- **Plastics** – used to “enclose” or “protect” critical electrical components:
  - UL 94 – for flammability ratings
    - Usually target a UL 94 V-0 rating
    - (Lowest) UL 94 HB → UL94 V-1, V-2, V-0 → UL 94-5V (Highest)
  - UL 746C – for suitability for use as an enclosure material
    - Addresses additional considerations such as strength and resistance to environmental factors; e.g., UV resistance.



# Components - Compliance

- For products which are to be NSF-certified (for Sanitation), Non stainless-steel materials used in components which come in contact with pool or potable water AND which have contact area of 100 sq. inches or more:
  - Component material must be NSF-listed as compliant with at least one of the following:
    - NSF 14
    - NSF 50
    - NSF 51
    - NSF 61





# Components - Compliance

- For Electrical/Electronic Products destined for EU, all materials must be RoHS compliant:
  - Get “Declarations of Conformity” (DOC’s) from vendors documenting compliance with the RoHS Directive (2002/95/EC)
- We are still required to further prove that our products, which utilize all purchased components comply with the applicable requirements of the RoHS Directive.
- We could be required to have our BOM analyzed and/or have our product physically tested for compliance.
- This could be expensive, and time-consuming





# Components - Compliance

Once Again, Remember –

- Use of listed/certified components ensures easier path towards compliance and certification of end-products
- Helps minimize responsibility/liability for the component...
- PUT THE ONUS OF COMPONENT COMPLIANCE AND CERTIFICATION ON THE COMPONENT VENDOR.

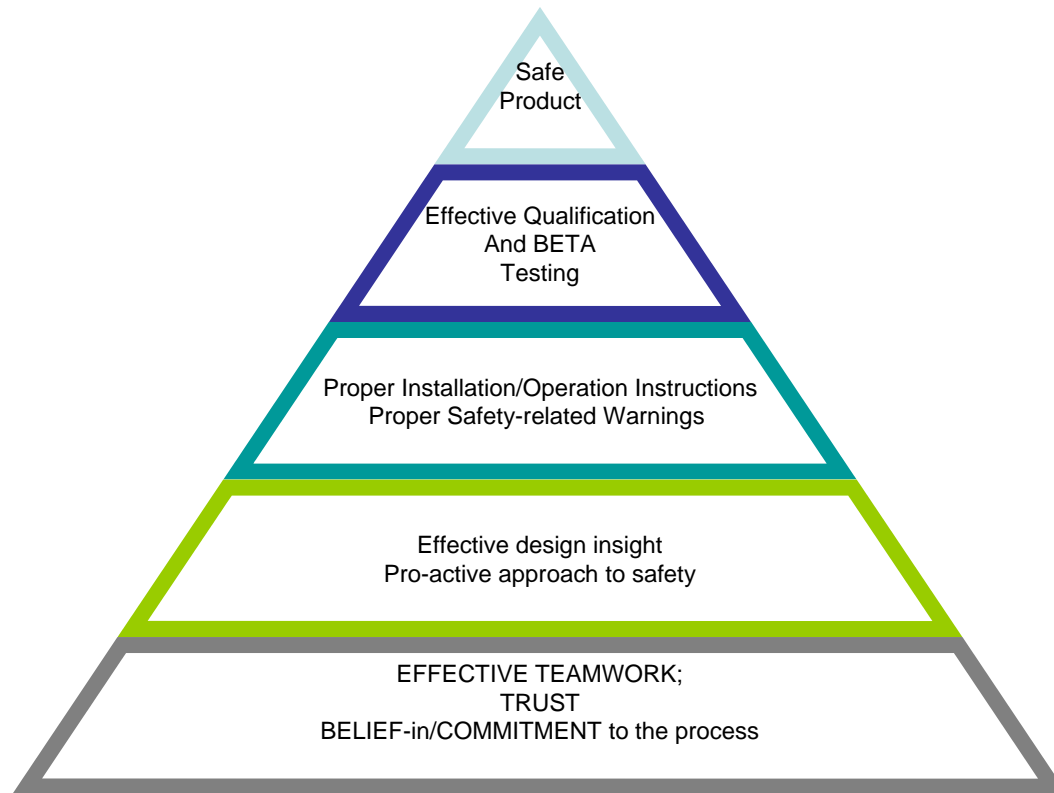


# Important Points to Remember

- Involve Compliance/Safety Staff EARLY in any project – regardless of whether it is a NEW product or modification of an existing product;
- Changes to manuals, labels, box art, etc... do affect compliance, legal, safety issues;
- Following established company processes related to product safety and document review is critical to ensuring:
  - Continued regulatory/agency compliance status of product
  - Mitigation of any possible legal issues that can arise from incidents involving products in the field



## Product Safety & Compliance





ZODIAC POOL SYSTEMS, INC.

END.