


**IAAPA**  
**Institute for Attractions Managers**  
**Facility Operations and Safety**

**IAAPA**  
education  
INSTITUTES

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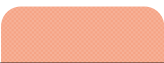



Operations and Safety   Revenue Operations   Marketing   Finance   Leadership

**Risk Management Practice**



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Industry Overview: How Safe Is the Attractions Industry?

Funworld Park's Risk Management Approach

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Skills Exercise – Case Study

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## Course Objectives



Upon completion of this course, attendees will be able to:

- Compare the safety of the attractions industry with other forms of recreation
- Define and describe risk management
- Understand ride safety manufacturing standards
- Analyze the three key parts of workplace safety practices
- Apply ways to maintain a guest-safe facility

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## Industry Overview



### How safe is the attractions industry?



- The attractions industry is safer than most other forms of recreation
- Injury risk rates\* for a variety of sports and recreation:
  - Football: 343
  - Basketball: 876
  - Fixed-site amusement rides: 8
  - Bowling: 39
  - Fishing: 88
- In 2007, over 300 million guests visited US amusement facilities; of the total 1,713 ride-related injuries, only 132 required overnight hospital treatment

Sources: NSGA, CPSC, IAAPA, Heiden Associates

\* Injuries per million activity participant days


Source: National Safety Council Research and Statistical Services Group: "Fixed-Site Amusement Ride Injury Survey," 2005 Update

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## Industry Overview (cont'd)



### How safe is the attractions industry? → Regulation

- US
  - Federal: OSHA
  - State level: varies by state
    - 44 of 50 states have amusement ride regulations - 27 based on ASTM F24
- Europe
  - Varies by country
  - UK = H&SAW Act + Industry led standards → HSG 175 
- RoW
  - National laws and regulations in India, China, Japan
  - Local regulations and ordinances in Hong Kong

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## Industry Overview (cont'd)



### How safe is the attractions industry? (cont'd)

- Safety in Design - Rides
  - ASTM's F2291 (F24 Committee)
  - EN13.814
  - Independent Design Reviews
- Safety Systems/Programmes
  - Food - Hazard Analysis and Critical Control Points (HACCP)
  - Food Safety training/certification (e.g. ServSafe®)
  - Lockout/Tagout (LOTO) – OSHA standard for control of hazardous energy release
  - Operator Training - BALPPA (NVQ)



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## Industry Overview (cont'd)



### How safe is the attractions industry? (cont'd)

#### IAAPA's Ride Incident Reporting System

#### European Ride Safety Reporting System

- First survey 2007, based on IAAPA's model
- EUROPARKS & IAAPA joint initiative
  - Fixed site/location rides (at least one ride)
  - Annual data collection
  - Three ride categories (Kiddies; Roller Coaster; Family/Adult rides)
  - 'Serious Injury' = immediate hospitalisation and >24 hour stay



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## Industry Overview



### How safe is the attractions industry?

#### IAAPA's European Ride Safety reporting System 2009



- The likelihood of a visitor suffering ride-related serious injuries:

= *less than 1 in 1,000,000 per park visit*

= *one chance in 7 million per ride taken*

Source: IAAPA/RPA 2009 Report

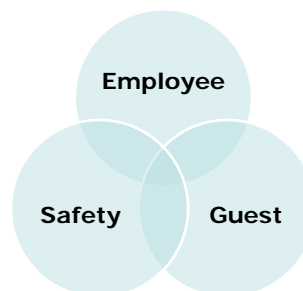
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## Funworld Park



### Funworld Park's approach to safety

- Funworld's mission statement – Focus on safety
  - Works to align all employees with good safety practices
- Safety awareness at all levels:
  - Owner
  - Management
  - Employees
  - Guests
  - Manufacturers



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## Funworld Park (cont'd)



### How Funworld Park approaches risk management

- At the owner level
  - Through leadership - "Successful risk management starts at the top."
  - Compliance with Local H&S laws
  - Risk management and Emergency Plan in place
  - Park safety programmes:
    - Lockout/Tagout programme in place
    - Safety Awards programme, Safety Committee
    - Reports incidents via IAAPA's Ride Safety Reporting Program
    - HACCP system for Food Safety
    - Employee Induction & training programme
    - Ride Operator Training & Evaluation

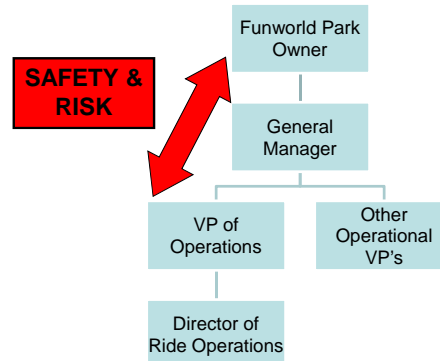
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## Funworld Park (cont'd)



### How Funworld Park approaches risk management

- At the corporate management level



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## Funworld Park (cont'd)



### Funworld Park's approach to risk management (cont'd)

- At the employee level
  - The frontline employee – ride operator/F&B operator – is the key to park safety
  - Training at Funworld – Safety focus
    - Employees understand the requirements for inspecting, maintaining, and operating the rides/maintaining safety in food service
  - Park focus is on:
    - Employees are well-trained, certified, audited
    - Rides are well-maintained, checked, certified
    - Food Safety Systems in place, monitored & audited



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## Funworld Park (cont'd)



### How Funworld Park approaches risk management (cont'd)

- At the guest level
  - Funworld's mission statement demonstrates a commitment to safety and taking care of guests throughout their Park experience
  - Guest responsibility is communicated via:
    - Signage and warnings
    - Park Guide Leaflets
    - Ride height, age requirements
    - Announcements



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## Funworld Park (cont'd)



### How Funworld Park approaches risk management (cont'd)

- At the manufacturer (design) level
  - All ride design/manufacturers provide specific instructions for safety in:
    - Installation
    - Inspection
    - Maintenance
    - Operation
  - Funworld follows guidelines through employee training and operator certification
  - Funworld is a member of the EN13.814 review committee

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## Risk Management Theory



### The business value of managing risk

- Why is risk management important to a facility operator?
  - Financial impact to company (negative cost associated with poor risk management)
  - Reputation/public perception (want to be seen as a safe place for guests)
  - Humanitarian (reduce and/or eliminate "pain and suffering" from injuries)
  - Compliance

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## Risk Management Theory (cont'd)



### The principles of risk management

1. Identify hazards.
2. Assess hazards to determine risks.
3. Develop controls and make risk decisions.

#### Controlling Risk:

- Education controls
- Physical controls
- Operational controls
- Avoidance

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## Risk Management Theory (cont'd)



### The principles of risk management

1. Identify hazards.
2. Assess hazards to determine risks.
3. Develop controls and make risk decisions.
4. Implement controls.
5. Supervise and evaluate.

#### A key point on risk:

- You can never completely eliminate risk; however, you do all you can to minimize it.

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## Risk Management Practice



### Ride standards in the amusement industry

- Overview of current standards
  - ASTM F2291, “Standard Practice for Design of Amusement Rides and Devices”
    - Ride analysis, clearance envelope analysis
    - Restraints, acceleration limits, loads/strengths
    - Rider weights, safety-related control systems
  - Safety governs each step of the ride design process: design, fabrication, installation, and operation
- Steps toward harmonization of ride design
  - IAAPA is working with standards officials worldwide to produce, implement universal ride safety criteria (Int’l Standards Harmonization Group)

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## Risk Management Practice (cont'd)



### Ride standards in the amusement industry (cont'd)

- Typical ride manufacturer’s approach to ride design – Standard design methodology
  - Blue-sky creative phase
  - Conceptual design, preliminary engineering – Including tests such as a preliminary Failure Mode Effects Analysis:
    - An FMEA evaluation assigns a number ranking to each mode of failure
    - The evaluated criteria are multiplied together to get an overall ranking
    - The higher the number, the more critical the part

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## Risk Management Practice (cont'd)



### Ride standards in the amusement industry (cont'd)

- Typical ride manufacturer's approach to ride design – Standard design methodology (cont'd)
  - Detailed design/engineering and prototype testing – Includes:
    - Finite Element Analysis (FEA)
    - Final FMEA Analysis
    - Risk Mitigation Testing
  - Manufacturing and acceptance testing
    - Strain gauge testing
    - Failure mode testing
    - Load cell testing
    - Cycle testing
    - Accelerometer testing
    - Clearance checking
  - Installation and testing, followed by operation and maintenance

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## Risk Management Practice (cont'd)



### Ride standards in the amusement industry (cont'd)

- Manufacturers' operation/maintenance requirements
  - Operation
    - Strict height and/or age, health requirements
  - Maintenance
    - Daily – Preventive maintenance, safety inspection
    - Required preventive maintenance schedule (weekly, monthly, annual)
  - Facility faces liability if ride requirements not met



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## Risk Management Practice (cont'd)



### Practicing safety in the workplace

- Three keys to safety: documentation, training, maintenance
- Documenting procedures for operational-level employees (ride operators)
  - Daily Ride Safety Inspection  Checklist used every morning
  - Operator “listening” to the ride  Important preventive check
- Employee training  and training strategy
  - Consistent, comprehensive training materials
    - Hands-on training for rides/attractions
    - Safety for food operations  PFA, ServSafe, HACCP
    - Training in guest services  Health, safety, emergency
  - Required number of hours of training



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## Risk Management Practice (cont'd)



### Practicing safety in the workplace (cont'd)

- Employee training  Verification of proficiency
  - Frontline employee testing
    - Written (knowledge of policies, guidelines, procedures)
    - Oral/practical (demonstration of proficiency)
  - Ride operation certification and validation
- Maintenance strategies
  - Maintenance
    - Green-tagging
    - Turn-over Sheets (from Maintenance Dept. to operator)
    - Daily - Safety inspection, preventive maintenance
    - Weekly, monthly, seasonal preventive maintenance



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## Risk Management Practice (cont'd)



### Practicing safety in the workplace (cont'd)

- Owner/manager safety practices
  - Safety and Security Audits
    - Regular and spot safety audits, by management
    - Annual third party safety audits  Covering operations, safety, maintenance, and risk/loss prevention
  - Emergency plan
    - Back-up generators in case of power failure
    - Crisis Management Manual

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## Risk Management Practice (cont'd)



### Maintaining a guest-safe environment

- Establishing and enforcing a safety expectation for employees and guests
  - Signage
  - Height, age restrictions and other standards
  - Rider "spiels"
  - First aid stations
  - Security - Lighting, security cameras, security personnel
  - Some parks have come up with creative ways of reinforcing safety with guests



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## Risk Management Practice (cont'd)



### Maintaining a guest-safe environment (cont'd)

- Establishing and enforcing a safety expectation for employees and guests (cont'd)
  - Other health and safety issues
    - Dealing with heat
    - Other weather conditions - Storms, rain
    - Medical emergencies
  - Handling customer issues sensitively

## A CULTURE OF SAFETY

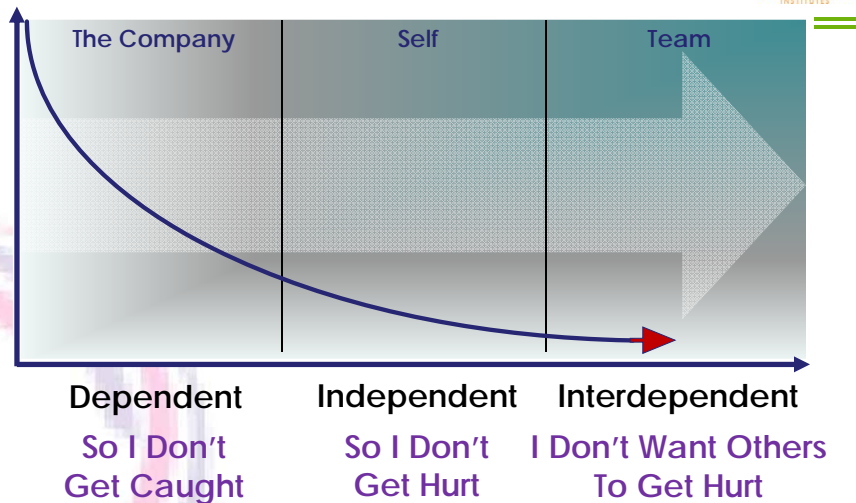


# CULTURE



Culture is observed and learned through interactions.

# SAFETY OWNERSHIP JOURNEY



## HOW MANY INCIDENTS CAN BE PREVENTED?

1. All
2. Most
3. Some
4. Few

## COMMUNICATION

### Coaching

- Helps you develop your competency as a Leader
- Adds to your credibility and integrity

### Feedback

- Most effective when delivered immediately
- Requires care when addressing safety





## Effective Safety Feedback

1. Open the conversation
2. Deliver the feedback
3. Rewind the situation
4. Listen and acknowledge
5. Close with care



## Risk Management Activity

Identify A Risk Management situation utilizing  
an Affinity Diagram

## What is a Affinity Diagram



Helps to organize verbal information into a visual pattern

Affinity Cards will include: Training, Vehicles, Operating Methods, Capacity, Restraints, Guest Behavior

Brainstorm ideas within this Affinity Diagram

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## Risk Management Theory



The risk assessment matrix

Risk Assessment Matrix						
Severity		Probability				
		Frequent	Likely	Occasional	Seldom	Unlikely
		A	B	C	D	E
Catastrophic	I	Extreme	Extreme	High	High	Moderate
Critical	II	Extreme	High	High	Moderate	Low
Marginal	III	High	Moderate	Moderate	Low	Low
Negligible	IV	Moderate	Low	Low	Low	Low

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## Fun World Risk Management Situation



Fun World wanted to reduce the number of small children hitting their face on the “Super Duper Splash” ride vehicle at zone 3 as the vehicle is in motion.

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## “Super Duper” Guest Injury Facts



32 children a month are hitting their head on the ride vehicle

10 of these Guests have received stitches

2 Guests were transported to the Hospital

20 Guests went to Central First Aid and enjoyed the rest of their day in the Park after seeing the nurse and taking aspirin

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## **“Super Duper” Ride System Facts**



**Flume type Attraction**

**Individual seating assignment**

**No seatbelt restraint**

**The Attraction has 5 vertical drops**

**The Attraction holds 6 people per vehicle**

**The height requirement is 40 inches (1,000mm)**

**The Attraction is a 4 minute ride cycle**

**The ride carries 1,000 Guests per Hour**

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## **Activity Expectations**



**Working in groups at your tables**

**Choose a spokesperson**

**Choose a scribe**

**Based on the situation, brainstorm utilizing an affinity diagram**

**Assess the Risk and provide solution to mitigate risk**

**Questions will be asked of your team**

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## Risk Assessment Questions

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What can be done to reduce risk?

What is contributing to the risk?

What is the severity of the risk?

What is the probability of the risk?

What are your final thoughts on mitigating the risk?