Non – Destructive Testing of Amusement Devices ‘a regulators view’

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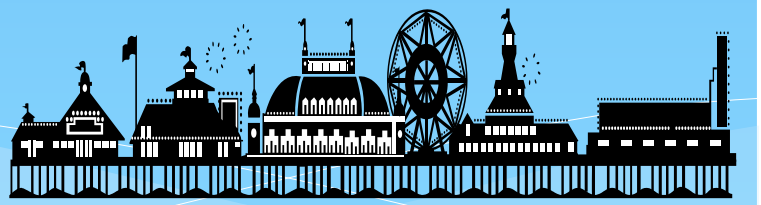

Introduction

- Problems encountered during HSE inspection of fairground rides
- Regulatory framework
- HSG 175 Fairgrounds and Amusement Parks, Guidance on safe practice
- ADSC guidance “Safety of amusement devices: non-destructive testing”
- NDT Schedules
- NDT practitioner role
- Content of NDT reports
- AIB checks prior to issuing DOC
- Conclusion

Problems encountered during HSE inspection of fairground rides

- Rides not being stripped for NDT to be carried out.
- Inadequate/ unclear recording on NDT reports.
- Inspections not being carried out in accordance with the NDT Schedule. Includes different / inappropriate NDT techniques applied.
- Rides with no ride-specific NDT Schedule. Includes rides without any schedule or which are using an NDT Schedule obtained from another ride owner.
- NDT Schedules with insufficient content.

Regulatory Framework

No industry specific regulations

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Health and Safety at Work etc Act 1974 applies

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PUWER 1998 requires device to be inspected and maintained in safe condition

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HSG 175 "Fairgrounds and Amusement Parks, Guidance on safe practice"

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ADSC Guidance "Safety of amusement devices: non-destructive testing"

HSG 175 "Fairgrounds and Amusement Parks, Guidance on safe practice

In-service annual inspection

Checks "the safety-critical components of an amusement device to ensure that they have not deteriorated to an extent liable to cause danger".

Safety critical components

Defined as "any type of component on an amusement device on which the safety of the passengers (or others who may be affected) is dependent".

HSE Inspection findings

- NDT practitioners are not following requirements in NDT Schedule and not recording reasons for this on NDT reports. Result is some safety-critical components not being adequately inspected.
- AIBs are not carrying out diligent checks to ensure all safety critical components have received sufficient NDT inspection prior to issuing DOCs which deem rides safe to operate.

ADSC guidance "Safety of amusement devices: non-destructive testing"

ADSC guidance states:

If a ride does not have an adequate NDT Schedule then:

- NDT should not be carried out
- A DOC should not be issued

Those working within the ADIPS scheme should be complying with the scheme and this guidance.

NDT Schedules (1)

- HSE asking for formal NDT schedules for all fairground rides which require NDT. This includes rides with a maturity risk assessment.
- No requirement in legislation to have NDT Schedule.
- However, law requires rides to be inspected by a competent person but there needs to be some basis for that inspection. An NDT Schedule provides this basis.
- Without an NDT Schedule, some safety critical component may not be identified and tested and could subsequently fail.
- NDT Schedule required to ensure testing is reliable and repeatable every year so that results can be compared.

NDT Schedules (2)

NDT Schedules should be prepared by a suitably qualified mechanical/structural engineer along with a person qualified in the NDT techniques to be used.

- The mechanical / structural engineer should identify the parts of the device that require testing, the frequency of inspection and the extent of dismantling required to gain access to them.

- The NDT practitioner should specify the appropriate test methods and techniques to be used. These must be reliable and repeatable so that results can be compared to previous results, if necessary.

NDT Schedules (3)

Content of NDT Schedules

- Frequency of in-service NDT (time or ride cycles)
- Safety-critical parts that require testing
- Clearly state NDT technique to be applied

  e.g MPI and UT (not MPI/UT)
- Extent of dismantling required
  - In-situ? If so, can you guarantee expected defects will be detected?
  - Part removed?
- Defect acceptance criteria

If NDT Schedule is not clear then it should be rewritten.

NDT Schedules (4)

No NDT Schedule

No NDT inspection

No DOC

NDT Practitioner role

- Carry out NDT in accordance with appropriate NDT Schedule
- Any deviations from NDT Schedule (including NDT technique)
  - Need approval from the Appointed Inspection Body (AIB) issuing DOC
  - Keep a record explaining deviations
- Write clear and accurate records to reflect inspection carried out

Content of NDT reports

- Clearly identify the safety critical components inspected
  - Use same terminology stated in NDT Schedule
  - Record parts examined from any sample. E.g. if 25% of welds inspected then clearly identify which 25% to ensure same sample is not inspected following year
- Confirm inspection followed the NDT schedule
- Confirm any further tests carried out
- Results of inspection
- Details of NDT methods, techniques and procedures used
- Date of inspection
- Inspector's name and qualifications

AIB checks prior to issuing DOC

- Check ride has an appropriate NDT Schedule
- Carry out diligent checks to ensure all safety critical components received sufficient NDT and device safe to operate
  - Achieved by checking content of NDT reports against content in NDT Schedule
  - If no NDT Schedule then consider whether there is sufficient information to sign DOC. You need to be able to demonstrate how you ensured all safety critical components were adequately tested
- Check components sampled and inspected on rotational basis are clearly identified and recorded
- Check any deviations from NDT Schedule (including NDT technique) are clearly recorded. Update NDT Schedule to ensure repeatability.

Conclusion

- Read and follow HSG 175 and ADSC guidance
- Carry out NDT inspections in accordance with an appropriate NDT Schedule
- Ensure NDT inspections are clearly recorded
- AIBs should make diligent checks before issuing DOCs (compare NDT reports against NDT Schedule)
- No NDT Schedule ⟹ No NDT Inspection
- No NDT Schedule ⟹ No DOC

* It is within your power to ensure rides are safe to operate! *

Any questions?