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Target Audience:  
FOD Inspectors with responsibilities for fairgrounds

## RISK ASSESSMENTS TO ESTABLISH MATURITY OF DESIGN FOR FAIRGROUND RIDES

This SIM is designed to assist inspectors, who visit fairgrounds and amusement parks, on maturity of design for fairground rides.

### INTRODUCTION

1 The following guidance sets out the basis for a maturity risk assessment including advice on when an assessment would be appropriate and how it could be undertaken. This SIM should be read in conjunction with [Entertainment Sheets 5](#) and [8](#) and HSG 175 Fairgrounds and Amusements Parks Guidance on Safe Practice (File 330). A glossary of terms can be found in HSG175 and Entertainment Sheet 5. In particular inspectors should be familiar with the definitions of maturity and safety critical.

### WHY A MATURITY ASSESSMENT MAY BE REQUIRED

2 For new fairground rides Section 6 of the HSW etc Act 1974 (as amended) puts very specific responsibilities on the manufacturers to ensure that their rides are designed and constructed so as to be as safe as is reasonably practicable.

3 The current mechanism which helps manufacturers achieve compliance is HSG175 in conjunction with the examinations incorporated in the Amusement Devices Inspection Procedures Scheme (ADIPS) scheme. HSG175 sets out a series of pre-use inspections which must be undertaken before a new ride is put into service including design review, assessment of conformity to design and initial test. ADIPS covers these inspections and details of such tests must form part of the operations manual. The operations manual must be available for inspection by registered inspection bodies and other interested parties throughout the life of the device.

4 When ADIPS was introduced, it was recognised that there would be a significant number of rides which had not been subjected to the initial inspections that HSG175 describes but which were none the less well designed and constructed. In these cases the manufacturer may have complied with Section 6 in a different way and it was clear that interim arrangements would be required to allow the ADIPS scheme to function and to allow declarations of occupational compliance (DOCs) to be issued in the absence of information on initial inspection. These interim arrangements only apply to devices that existed in the UK **prior to October 1997**. The interim arrangements introduced the concept of a ride that was of a mature design. In essence this means that there is sufficient relevant

information available to determine that the ride design has a history of safe operation and has therefore stood the test of time.

5 Ride controllers can, with the help of appropriate inspection bodies, establish that a ride is well designed and constructed in the absence of pre-use inspection information by undertaking a maturity risk assessment. Such an assessment is in addition to the operational risk assessment required for all rides.

6 Before a ride controller seeks the advice of an inspection body they will need to satisfy themselves that the inspection body has the necessary competence to assist with the assessment.

7 Controllers should understand that the responsibility for producing a maturity assessment, should one be required, rests with them. They cannot claim maturity for an older ride by right. Just because a ride is old, it does not automatically follow that it is mature. When inspectors see a ride that has been declared mature they should also expect to see a risk assessment that supports this conclusion.

8 Whilst the history of other rides is useful supporting evidence controllers should be wary of placing too much emphasis on such information unless they are certain that the other rides are identical in design and manufacture. In theory it is possible to build a new ride to an established design then claim maturity for the device. However, unless it can be demonstrated that the design **and** manufacture were identical it cannot be declared to be mature.

#### WHEN IS A MATURITY RISK ASSESSMENT APPROPRIATE?

9 Prior to deciding on the quality of maturity risk assessments inspectors must first decide whether it is appropriate for a controller to undertake such an assessment. The following issues should be borne in mind;

1) if the ride has a relevant design review and initial inspections then it does not need a maturity assessment;

2) if the ride was not in existence in the UK prior to October 1997 it cannot be considered mature;

3) to carry out a maturity risk assessment a controller will need around five years of relevant history for the ride under consideration. (The required history is described below.) Although the figure of five years is given as guidance and will need to be considered in the context of the risk assessment it is unlikely that a ride with less than five years history could be declared mature;

4) a ride which has had very little use in the last five years may require more than five years history to demonstrate that it is capable of operating safely over a sustained period;

5) ride histories are best presented in written form;

6) a controller must know whether the ride or any part of the ride been modified. If one of the safety critical parts of the ride has been modified within the last ten years then a partial design review of the ride which covers the modified part is required. Modifications that took place more than ten years ago may have

sufficient history of safe operation to be considered mature. Again, the period of ten years is given as a guide. If the rest of the ride is unmodified it could be the subject of a maturity risk assessment provided the other criteria are met;

7) if the whole ride has been modified a complete design review is required and maturity assessment is not appropriate.

#### DOCUMENTS REQUIRED FOR A MATURITY RISK ASSESSMENT

10 Before a controller undertakes a maturity risk assessment they will need the following documents and information;

1) HSG 175;

2) the accident history for the particular ride and the class of ride, detailing accidents arising from the ride design (for at least five years). Accident history for classes of ride may sometimes be difficult to obtain and inspectors (HSE or Registered Inspection Bodies or both) should steer ride controllers towards their trade organisations, eg British Association of Leisure Parks Piers and Attractions, Showmen's Guild of Great Britain, etc;

3) details of modifications to safety critical parts;

4) controller's risk assessment;

5) maintenance records (including repairs) and records of previous thorough examination including non-destructive testing for five years. These are important because they may indicate areas of concern with the design. They are also important because they indicate the parameters within which the device should work and which will have contributed to its record of safe operation;

6) details of ease of accessibility of and frequency of testing and inspection of safety critical parts. If safety critical parts are inaccessible then it may not be possible spot emerging problems at an early stage and it may be that they have not been inspected thoroughly over the years. Under these circumstances it is likely that a partial design review will be a more appropriate method to decide that these parts are safe;

7) other information, eg HSE PM Series guidance notes, National Association for Leisure Industry Certification (NAFLIC) bulletins, manufacturers information, etc which relates to the class of ride and any problems with design;

8) a well-prepared operations manual is an essential aid to the maturity assessment and without it, it is unlikely that maturity could be established, as all of the evidence required to support the conclusions of the assessment should be contained within such a manual. Further information on operations manuals can be found in HSG175 Appendix 3.

#### MATURITY RISK ASSESSMENT

12 When discussing maturity risk assessments inspectors should direct controllers to HSG175 paras 20-23 and HSE leaflet INDG163 (rev1) *Five steps to risk assessment* (File 200).

13 Controllers will need to have identified that:

- 1) the hazard is injury due to the failure of a safety critical part as a result of poor design;
- 2) persons at risk may be riders operators or bystanders;
- 3) the principal control measure, for the purposes of this assessment, is the integrity of the design and construction which has reduced risk to an acceptable level. The evidence that the design is adequate is based on a number of years of safe operation and should be contained in the documents listed above;
- 4) the design and construction must be capable of withstanding all types of failure including corrosion wear and fatigue and the evidence for each must be considered;
- 5) the ability of the design to withstand deterioration is dependent on the correct operation of the ride coupled with adequate maintenance and through examination.

14 The findings of the assessment must be recorded in a suitable form to allow controllers to support the conclusion that a ride is mature. The maturity assessment should be appended to the operations manual.

#### ADVICE TO INSPECTORS

15 When inspectors visit fairgrounds they should ask to see copies of DOCs for the rides they inspect. Many of these DOCs will contain declarations which state that the particular ride is mature by designer that the assessment is due for completion by a certain date. Such declarations should always be supported by written maturity risk assessments, which inspectors may wish to consider the basis for the declaration using the information in this SIM and the checklist at the [Appendix](#). This may be particularly relevant where an accident arises from a design aspect of the ride. **Maturity risk assessments should be completed by 30 April 2004.**

16 The Appendix indicates some of the questions which will require answers when ride controllers undertake maturity assessments and can provide the basis for inspectors to assess the adequacy for such assessments. Where assessments have yet to be completed the Appendix may be given to controllers to assist them in recording their assessment. Where assessments have yet to be completed the Appendix may be given to controllers to assist them in recording their assessment. It is not an exhaustive list and the controller and the registered inspection body will need to actively consider whether other factors are important in assessing a particular ride.

17 If it cannot be established that the ride is mature then the necessary design review(s) must be undertaken before the deadline set out in [Entertainment Sheet 8](#).

#### INFORMATION

18 Inspectors wishing further information should contact the Food and Entertainment Sector at the Glasgow Office (VPN: 521 3094).

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APPENDIX  
(paras 15 and 16)

- 1 Does the device have evidence of initial inspections?
- 2 Was the device in the UK prior to October 1997?
- 3 Have you identified the safety critical parts with the help of an inspection body?
- 4 Has the ride been modified in the last ten years? (If yes maturity cannot be established and a complete design review is required.)
- 5 Have any safety-critical parts of the ride been modified in the last ten years? (If yes consider a partial design review of new parts and consider maturity for older parts).
- 6 Has the ride been used continuously and do you have at least five years history of operation (in your operations manual)?
- 7 Does this history indicate the ride has operated safely for at least five years?
- 8 Do you have maintenance records, details of repairs and details of past examinations for at least five years?
- 9 Do these indicate that the design of any part of the ride may have been a cause for concern taking into account foreseeable modes of failure and the existing control measures (including inspection and maintenance)?
- 10 Are all of the safety critical parts of the ride accessible? (If no, what measures have been taken to ensure the continuing integrity of these safety related parts?)
- 11 Do you have the accident history for this class of ride?
- 12 Does this indicate that there might be a problem which might affect your ride?
- 13 Do you have access to HSG175, other relevant HSE guidance and industry guidance such as NAFLIC bulletins for this type of ride?
- 14 Do these documents indicate that there might be a problem which might affect your ride?
- 15 Does the Operating Manual contain other details required in HSG175 Appendix 3?
- 16 Do these indicate how the ride should be operated, inspected and maintained?
- 17 Does the above information when considered as a whole demonstrate that the ride has an adequate history of safe operation which indicates that the risk of injury arising from a failure of design is at an acceptable level?