

Statens haverikommission
P.O. Box 6014
SE-102 31 Stockholm
Sweden

Brussels, October 23, 2024

In response to your recommendation included in document O-6/23

Dear Mr Ahlberk,
Dear Mr Ojala,
Dear Ms Olsson,

We are responding on IAAPA's behalf to the recommendations made to our association in SHK's report covering the accident on the Jetline roller coaster in Gröna Lund, Stockholm, File number O-6/23 published on June 14, 2024. We received a translated version of the file on September 10, 2024.

Your recommendation on page 58 of the report directed at us reads as follows:

“The International Association of Amusement Parks and Attractions (IAAPA) is recommended to:

Disseminate SHK's final report to its members and in its safety forums in order to provide members with evidence upon which to assess whether there is a need to alter requirements for restraint devices in rollercoasters.

When providing such information, the observations in the report about the need for a systematic approach to safety work and the use of replacement parts in rollercoasters should also be highlighted (see sections 2.3 and 2.6). (SHK 2024:07 R6)”

We thank you for including our association as part of your work. We believe that active industry participation is important for addressing the findings you have outlined in your report and are happy to cooperate in this matter. Learnings from accidents like this should be put in front of the global technical community, our members and the amusement industry standards committees (CEN Technical Committee 152 for EN13814 and ASTM Committee F24 for ASTM F2291, F1193, F770 and F2974), ensuring that members can learn safety best practices and allowing the standards community to evaluate if current standards need modification.

IAAPA advocates for safety relying on recognised norms for ride design, operation and maintenance (EN13814-1:2019/ASTM F2291-24 and F1193-24, EN13814-2:2019/ASTM F770-22, EN13814-3:2019/ASTM F2974-24a), as well

as industry education. We support our members through various in-person education events focused on safety at our expos (Safety Day: 8-hour education event, Safety Exchange: 2-hour incident sharing and best practice discussion, and/or Safety Institute: 6-hour education event for young professionals). IAAPA also publishes news updates, white papers and hosts webinars. We are committed to promoting safety as a strategic value for the amusement industry.

We would like to highlight that IAAPA can only comment on the actions performed and discussed within our organisation or within the forums we provide to our members. We cannot comment on individual actions taken by any of our members or discussions held outside of our organisation events or in forums provided by other institutions. For full transparency, Gröna Lunds Tivoli has been a member of our association since 1979.

Our analysis of your recommendation has resulted in three separate areas of action for our association:

- Disseminating your report and its findings to our members and amusement industry safety professionals.
- Distributing your request to the EN13814 and ASTM F24 safety standards committees and the EN/ASTM Standard Harmonisation Taskforce for Restraints so they can assess whether there is a need to alter requirements for restraint devices in roller coasters.
- Creating a taskforce to author a white paper and conduct a webinar discussing best practices and providing guidance for “Change Management – Modifications to Amusement Rides and Devices”. The topic of modifications does include replacement of parts on an amusement ride or device.

IAAPA deploys multiple committees, taskforces, and working groups to engage its membership in discussions covering topics of importance for our industry. These groups are staffed with experts from all areas of our membership, including Owners/Operators, Manufacturers and Suppliers, Third Party Inspection Bodies, and Industry Consultants. Their work covers topics including safety and security education and the harmonisation and adoption of global amusement industry safety standards. The output we provide for our members together with these experts include education programs at our events, webinars, as well as creating resources for industry professionals like white papers. We have identified the following groups as relevant to our response to your recommendation:

- IAAPA Global Safety Committee
- IAAPA Regional Safety Subcommittees: EMEA, North America, Asia Pacific, Latin America
- IAAPA EN and ASTM Standard Harmonisation Taskforce
 - o Restraint Expert Group
- IAAPA EMEA Taskforce “Change Management – Modifications to Amusement Rides and Amusement Devices”

Dissemination of the report:

As an immediate action, an automatically translated version of the report was shared with the IAAPA Global Safety Committee and the IAAPA EMEA Safety Subcommittee on June 14, 2024. For your information, the IAAPA Global Safety Committee also includes the chairs of our other regional IAAPA Safety Subcommittees¹.

We have informed all facility members in Europe about the imminent publication of the report via e-mail on June 13, 2024, and published a news article on our global news platform “Funworld” on September 6, 2024. This article covers the accident, includes a link to your report, reviews the contributing factors and includes an interview with the CEO of Gröna Lund².

In addition, we also performed the following actions after receiving the official English version of the report on September 10th:

- We shared the official translation of the report with our Global Safety Committee and the EMEA Safety Subcommittee on September 10, 2024, and the North American, Latin American and Asia Pacific Subcommittee on September 21, 2024.
- We included a download link to the official English version of your accident investigation report to the “Funworld” article mentioned above.
- We shared the “Funworld” article with our global membership through our IAAPA News Daily email on September 16, 2024, highlighting the learnings and the availability of the accident investigation report.
- We shared the official translation of the report with Safety professionals in the EMEA region as part of our regional Safety Update email on October 23, 2024.
- Gröna Lund presented the background of the accident and their learnings during Safety Exchange on September 25, 2024, at IAAPA Expo Europe in Amsterdam. We hosted a discussion on Change Management with a focus on Safety Related Parts after their presentation. We had key personnel from facility operators, manufacturers and suppliers, as well as third party inspection bodies attend this event.
- We presented the details of your investigation report at the meeting of the ASTM Committee F24 in Anaheim, California, United States of America on October 17, 2024. This committee is responsible for authoring the ASTM standards applicable to Amusement Rides and Devices in countries where ASTM Committee F24 standards are being applied, including the United States of America and multiple other countries in the world.

¹ Access a complete list of the members of the [IAAPA Global Safety Committee](#) and [IAAPA EMEA Safety Subcommittee](#) online.

² The “Funworld” article is available at: <https://www.iaapa.org/news/funworld/insights-grona-lund>.

- The steps outlined above virtually assure that the report was distributed to all IAAPA members and beyond.

Assessment whether there is a need to alter requirements of restraint systems for roller coasters:

We have relayed your report and your recommendation to individuals from the IAAPA Global Safety Committee, the IAAPA EMEA Safety Subcommittee, the Standard Harmonisation Taskforce and its Restraint Expert Group, as well as IAAPA members not organised in one of our committees.

IAAPA also created an expert group specifically to review your accident report. The individuals for the expert group were selected by the chair of the IAAPA Global Safety Committee and IAAPA staff based on their experience and their involvement in CEN and ASTM safety standards committees.

The expert group consists of individuals working for:

- multiple owner/operators with facilities in Europe, the United States of America, and Asia,
- a third-party verification/inspection body based in Germany,
- an amusement ride/device manufacturer based in the Netherlands,
- an amusement ride/device manufacturer based in Germany.

The expert group includes the two chairs of the Standards Harmonisation Restraints Taskforce. One chair represents EN13814, and the other chair represents ASTM F24. This Standards Harmonisation Restraints Taskforce includes the two chairs and multiple restraints experts who have been reviewing the current language in both standards.

The applicable standard for amusement ride devices and restraint systems for Sweden is EN13814:2019. It is the understanding of the expert group that the main cause for this accident is to be found in the modifications made to the replacement carrying arm for Jetline's train and the systematic failures found in the manufacturing process. EN13814 includes multiple segments with language targeted at modifications to safety related parts, including (but not limited to) definitions for "major modifications" (EN13814-1:2019; 5.4.2.5), a requirement for manufacturers to provide a procedure for handling changes and modifications (EN13814-1:2019; 5.4.3.1), requirements for servicing and repairing an amusement device as well as modifications made during service (EN13814-2:2019; 4.3.8.2 - 4.3.8.4.).

It is the understanding of the expert group that a similar accident could be prevented if EN13814 and common risk management practices are applied correctly. Utilising these practices as detailed in the safety standard would address the main root cause of the accident: the failure of the carrying arm. The design and operation principles of the amusement industry are first focused on preventing accidents from occurring.

The expert group also highlighted their concern how stronger restraints which did not bend would have enabled other more severe internal injuries to more of the riders due to greater pressure applied to the soft tissue abdomen area because of the greater g-forces from the abrupt stops during the accident. The restraints experts of the group also informed us the restraints language of the standards is consistently updated based on new research about restraints. Therefore, their initial review is that the technical requirements regarding modifications already cover the main factor for this specific accident. However, they will discuss this accident and restraint designs amongst their technical expert groups who author the safety standards.

IAAPA is committed to bring these topics and the findings of your report to the awareness of the technical committees. This includes CEN Technical Committee 152 (EN13814) and ASTM Committee F24, who are drafting and publishing the standards for amusement rides and devices under both standardisation frameworks. IAAPA believes that these are the forums to address these issues, and even if the topics have been discussed in the past already, the topics can be brought forward again. As mentioned earlier, key members of these committees have been included as members of the expert group we formed to write this part of our response.

Creation of a Taskforce called “Change Management – Modifications to Amusement Rides and Amusement Devices”:

IAAPA has established a taskforce working on a white paper titled “Change Management – Modifications to Amusement Rides and Amusement Devices”.

The members of this taskforce are working for:

- multiple operators with facilities in Europe, the Asia Pacific Region, the Middle East, and the United States of America,
- an amusement device/ride manufacturer based in Germany,
- an amusement device/ride manufacturer based in the Netherlands,
- a third-party inspection body/consultancy based in the United Kingdom,
- a third-party inspection body based in Germany,
- a risk-management/safety consultancy based in Switzerland.

The taskforce will focus on the modification process of safety related parts. The outcome of the taskforce will be a whitepaper with additional guidance on the management of safety related parts from an operator’s perspective, from a manufacturer’s perspective, and from an Inspection body perspective. It will also cover modifications to safety related parts, maintaining safety

related parts for orphan rides³, as well as management of remote access/software adaptations to Ride PLC's.

The taskforce has met three times so far and presented their approach to safety experts that attended Safety Day during IAAPA Expo Europe, which took place on September 23, 2024. Their content proposal was positively received, and comments on the content from our wider membership noted.

We aim to publish this white paper, which will be available for free for IAAPA members, in 2025. This white paper will be accompanied by a webinar, which will be available for free to IAAPA members, in 2025.

To further identify education opportunities, we will survey our members on what they identify to be the most pressing challenges in maintaining older and orphan amusement rides. We plan to use the outcome of this survey to produce new educational content and discuss the topics at future virtual and in-person events.

Please let us know if you have any further questions or require further information or clarification. We remain available for any future inquiries you might have.

Kind regards,

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³ Orphan rides are considered to be amusement rides where the original manufacturer is no longer in business.