

**LOG OF MEETING
DIRECTORATE FOR ENGINEERING SCIENCES**

SUBJECT: ASTM F24 Committee Meeting on Amusement Rides and Devices

DATE OF MEETING: October 13 through 16, 2021

PLACE OF MEETING: Albuquerque Marriott, Albuquerque, NM

LOG ENTRY SOURCE: Daniel Taxier (ESMC)

COMMISSION ATTENDEES: Daniel Taxier (ESMC), Joe Williams (EXC)

NON-COMMISSION ATTENDEES: Contact ASTM for attendee list.

SUMMARY OF MEETING:

This was the fall meeting of the ASTM F24 Committee on Amusement Rides and Devices. The committee meets semiannually. The related subcommittees and task groups met to discuss ongoing standards development and other factors pertaining to the safety of amusement rides and devices.

During the meeting, CPSC staff presented a redacted in-depth investigation (IDI) 191015CFE0004, which had been sent to the committee chair in September. The IDI describes an incident where a 10-year-old female was ejected from a spinning amusement ride, resulting in her death. CPSC staff responded to questions about the contents of the IDI. One committee member described how this type of ride pushes riders together. When riders are seated next to strangers, this can result in undesirable rider behavior that may defeat certain restraint systems. CPSC staff asked the F24 committee to consider whether its standards included guidance to address this scenario. CPSC staff described during the meeting how a common fix for this type of ride is to add a redundant restraint, such as a seatbelt. A California regulator described a restraint analysis done on a similar type of ride which concluded that a seatbelt was necessary to prevent "rider separation" from the ride. CPSC staff asked the F24 committee to consider whether its standards include enough guidance on the restraint and containment analysis to prevent incidents such as this. As a result of this discussion, the Restraints task group agreed to review the redacted IDI and make any recommendations at the following F24 meeting in February.

CPSC staff additionally attended the following task group meetings:

F24.20 Risk Assessment

The task group is developing a new core standard that will provide guidance for designers to conduct a safety-based risk assessment of amusement park rides and devices. The standard is intended to be applicable to all amusement attractions while harmonizing with existing lifecycle standards. A draft was balloted in the subcommittee for feedback, with the ballot closing at the end of October; much of the meeting was a discussion of the feedback received thus far. Some subcommittee members would like to see clarification on the roles for doing a risk assessment (producer, integrator, user) and how those compare to the roles in existing F24 standards (designer/engineer, manufacturer, owner/operator). Others wanted to see how the risk assessment would apply to different types of modifications. This task group is coordinating with the Lifecycle task group and the Modifications task group.

F24.24 Evacuation Task Group

This task group discussed the results of a recent ballot on evacuation analysis in F2291 Standard Practice for Design of Amusement Rides and Devices. Some negatives said the evacuation analysis requirements did

not offer enough guidance as to what needs to be included or addressed. The negatives were found persuasive; the task group will revise the language and point to the owner/operator requirement to develop an evacuation plan in F770 Standard Practice for Ownership, Operation, Maintenance, and Inspection of Amusement Rides and Devices as guidance. The revised language is expected to be balloted prior to the winter meeting in February.

F24.24 F1193 Task Group

This task group discussed the results of recent ballots for F1193 Standard Practice for Quality, Manufacture, and Construction of Amusement Rides and Devices. Ballots which moved welding requirements to F1193 from F2291 passed; a ballot which added a certification documentation requirement passed. Other ballots on bulletin notifications to and from manufacturers, non-conforming component requirements, and other miscellaneous items received persuasive negatives and will be re-balloted. The passed ballots will be held administratively for a revision of F1193 in 2022.

F24.24 Restraints Task Group

The task group discussed the results of three recent ballots. The first ballot on updates to F2291 appendix language addressing small and large rider restraint accommodation to avoid rider ejection had one remaining negative based on concerns that “ejection forces” was not a defined term. The negative voter offered to withdraw the negative during the meeting so the ballot could move forward, and the task group could continue refining the language in a later ballot. A second and third ballot which included language that would harmonize with *EN 13814 – Safety of amusement rides and amusement devices* each received two opposing negatives (each negative voter did not agree with the editorial changes proposed by the other negative voter). The negatives were ultimately resolved at the subcommittee level, where a new task group was formed to address the non-mandatory language concerns brought up by one of the negative voters; both negatives were ultimately withdrawn as a result.

The task group agreed to take on new business of reviewing requirements for Area 4 restraints. As previously discussed, the task group will also review the redacted IDI presented by CPSC staff and develop recommendations for discussion at the next meeting.

F24.24 Task Group on F2291 Acceleration

The task group discussed much of the work in progress, including past ballots. The active topics included:

- Revisions make clarifications to the “prone” restraint area. The task group believes the term “prone restraint” is a misnomer, and has three ballots planned before the next meeting to make the necessary changes.
- Clarification of existing content discussing limits on XY reversals. The task group lead is working to resolve negatives and make necessary changes editorially.
- A review of Delta V limits (limits on short bursts of acceleration). The group is working on a method to share data or results from traditional acceleration analysis methods. The task group lead suggested some simple software be developed for everyone to use in analyzing datasets and determining appropriate limits. The goal is to have the analysis completed by the next meeting.
- Harmonization with an MLIT Japan proposal to place limits on lateral acceleration. Japan regulations include lateral load and restraint requirements that are not present in F2291. The task group lead determined there was no dataset available from MLIT Japan for review. The task group will review the requirements and develop recommendations ahead of the next meeting in February.
- Development of language for acceleration test methods on patron-directed rides due to the planned obsolescence of F1159 Standard Practice for Design of Amusement Rides and Devices that are Outside the Purview of Other F24 Design Standards.

- A discussion of wood coaster restraints.
- Review of a ballot which included special considerations for design when a head-mounted display is used. Significant modifications to the language in the ballot were made, and are expected to show up in the next ballot.
- Multiple-exposure (re-ride) limits. Should there be limits on how many times a person can go on a ride? This topic may be moved to the F24.40 Operations subcommittee.
- ISO 17842 Review and Harmonization. The task group will produce recommendations on a few areas where ASTM and ISO standards do not harmonize.

F24.24 Documentation

This task group was formed to correct references and clarify the purpose of the documentation section in F2291. The task group discussed the results of a ballot which would add a section scope, consistent with other sections within the standard. Two negatives were found persuasive, and the change will be re-balloted prior to the next meeting. The task group then discussed other possible changes that could be made to clarify the requirements in the documentation section.

F24.24 Task Group on Ride Modification

The task group discussed moving away from the major/minor modification classifications in the current F24 standards, and toward a risk-based approach. This process would identify whether a change to a ride or device has an impact on safety, and would adequately mitigate any risks associated with those impacts. The group is coordinating with the Lifecycle and Risk Assessment task groups to use common language. Most of the meeting was devoted to working through examples of how the risk-based approach could be implemented on different types of modifications.

F24.61 Adventure Attractions Subcommittee Meeting

The subcommittee approved the agenda and previous meeting minutes. The subcommittee discussed the challenge of having multiple parallel standards with different specific needs but with similar overarching goals for their respective industries. The subcommittee heard reports from its task groups on bungee jumping, amusement challenge areas, aerial adventure courses, trampoline courts, air inflated devices, and inflatable impact attenuation systems. The subcommittee has an open item to define its scope. No new business was discussed.

F24.24 Subcommittee Meeting

The subcommittee approved the agenda and previous meeting minutes, and heard reports from all of the F24.24 task groups which met during the F24 meeting. Then the subcommittee reviewed old business, which was assigned to task groups where possible. The Documentation task group took on an item to review language where the designer/engineer is required to provide certification on meeting certain requirements. The Restraint task group took on an item to review a report written by a student volunteer which found the terms "restraint" and "containment" were misused in several places. The subcommittee took on new business to look for terms that have definitions within F2291, but are not used in the text of the standard.

F24 Main Committee Meeting

The committee approved the agenda and previous meeting minutes. Each of the subcommittees provided a report summarizing the activity which had occurred over the duration of the meeting. The committee also heard reports from several industry organizations. Because the meeting was being held in a hybrid in-person and online setting, the committee chair asked that votes to find negatives non-persuasive be held through the online ballot system, rather than in-person.

Contact ASTM for meeting minutes. The next F24 committee meeting is expected to take place February 2 through February 5, 2022 at Hilton Atlanta in Atlanta, Georgia.