Log of Meeting

Subject: ASME A17/B44 Escalator and Moving Walk Committee

Date of Meeting: August 26 and 27, 1997

Place: Hyatt Regency O'Hare, Rosemont, IL

Log Entry Source: Scott Snyder, ESME (x1317)

Date of Entry: September 3, 1997

Commission Attendees: Nick Marchica and Scott Snyder, ESME

Non-Commission Attendees: See Attendance List (to follow, when available from ASME)

Summary of Meeting:

See Meeting Agenda (Attached)

Meeting Minutes (to follow, when available from ASME)

Codes and Standards

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AGENDA

A17/B44 Escalator & Moving Walk Committee

Hyatt Regency O'Hare
93 West Bryn Mawr Ave.
Rosemont, IL 60018

Tuesday, August 26, 1997, 8:30 am - 5:00 pm
Wednesday, August 27 1997, 8:30 am - 5:00 pm

1 CALL TO ORDER

The meeting will be called to order at 8:30 am on Tuesday, August 26, 1997.

2 RECORD OF ATTENDANCE

3 ANNOUNCEMENTS

4 ADOPTION OF AGENDA

5 APPROVAL OF MAY 14, 1997 MINUTES

6 PERSONNEL

The following Escalator and Moving Walk Committee personnel actions were approved since the last Committee meeting:

Marino Liberatore	approved as Corresponding Member
Davis Turner	approved as Member

Following the May 1997 meeting, the Secretary wrote to Mr. Caster asking his intentions for future participation, as Mr. Caster had not attended the previous four meetings. No response has been received.

See **Attachment 1** for a copy of the Committee Roster and the attendance record.

7 REQUESTS FOR INTERPRETATION

7.1 Inquiry 97-26 (Attachment 2)

Committee: Escalator and Moving Walk

Subject: Section 805
Escalator Phase Reversal

Edition: A17.1-1996

Question(s):

The A17.1 Code requires phase reversal protection of elevators but does not require it of escalators. The National Electrical Code does not require phase reversal protection for either. Please explain why escalators do not need this protection.

Discussion:

8 A17/B44 HARMONIZATION

Background:

TRs TABLED FOR HARMONIZATION

TR 96-03a. Comb-Step Impact Device. Rule 805.1u
TR 96-03b. Combplate Impact/Uplift
TR 96-10. Skirt Panel Brush Deflector Device. Rule 805.1w
TR 96-23. Signs on Steps, Risers and Balustrades. Rule 805.2
TR 96-54. Inspection Control
TR 96-55. Escalator and Moving Walk Signage
TR 97-xx. Pit Drains
TR 97-xx. Minimum Distance Between Escalators
TR 97-xx. Protection of Supports & Machine Spaces Against Fire. Rules 801.1 and 901.1 (Inquiry 97-07)
TR 97-xx. Handrail Speed Monitoring Device. Rule 805.4
TR 97-15. Audible Alarms. Rules 905.1b(1), 905.1l, and 905.1m

TABULATIONS

The Tabulations listed below were completed at the May 1997 meeting and were subsequently distributed for letter ballot approval to the A17 Main Committee and B44 Technical Committee. The ballot was issued on July 2, 1997 and closes on August 13, 1997. A copy of the tabulations is enclosed with this Meeting Agenda.

July 1997 Tabulations
Section 3. Definitions (includes only those definitions assigned to the Escalator Committee)
Part VIII. Escalators
Part IX. Moving Walks
Section 1105 of Part XI
Appendix G. Recommended Practice for Accelerated Moving Walks

Discussion:

The letter ballot for each of the above sections/parts is scheduled to close on August 13, 1997 and the results will be circulated prior to the meeting. The Committee must review all of the objections and comments resulting from the letter ballot and prepare proposed responses.

9 APPROVED TRs

See **Attachment 3** for the Escalator and/or Moving Walk Committee TRs which have been approved by the A17 Committee for A17.1a-1997 and for A17.1b-1998.

10 HANDRAIL HEIGHT AND GUARDRAILS (TR 94-28)

10.1 Stationary Guardrail

Background:

{See also Attachment 8 of the April 1996 minutes}

At the March 1995 meeting, the Committee voted to forward the following proposal to the A17 Code Coordination Committee for consideration {Approved - 7, Opposed - 3 (Schaeffer, White, Hayes)}:

Proposed Rule:

1. Every escalator or bank of escalators adjacent to an open wellway shall have a guardrail. The guardrail shall be a minimum of four (4) inches horizontally away from the moving handrail. This shall be measured from the vertical plane described by the outer surface of the moving handrail and the vertical plane described by the inner surface of the guardrail.

2. The height of the top surface of the guardrail shall not be less than 42 inches measured vertically above the step nosecline on the incline and shall not be less than 42 inches measured vertically above the 2 to 4 flat steps at the landings. A transition at the top and bottom curve shall be based on the geometry of a particular manufacturers design.

3. The guardrail shall be designed in such a manner as to prevent objects from being caught between the escalator handrail and the guardrail.

Placement of Rule:

1. BOCA National Building Code
   Section 3011.0, Escalators and Moving Walks - New rule 3011.3

2. UBC Uniform Building Code
   Chapter 30, add new Section 3008

3. SBCCI Standard Building Code
   Chapter 30, add new Section 3005

4. National Building Code of Canada - Add to 3.7.1.4 and 3.3.1.17

Reason: There has been an unexpected history of falls over the sides of escalators. While in general it seems most of this is due to "horseplay" or inebriated people not fully aware of where they were or what they are doing. Dr. John Fruin, a highly regarded expert, has pointed out that a 42 inch (1067 mm) minimum guardrail is needed. To protect against potential abuse or reasonable use, depending on ones viewpoint, guard rails should be mandatory where there are open atriums or other spaces.

At the June meeting, Mr. Kappenhagen reported that the A17 Code Coordination Committee briefly reviewed the above proposal at their June 5 meeting. Representatives from the three model building codes were present at the meeting; however, since the Building Code groups had previously agreed to develop

opposed the proposal as they felt there was not enough information to support a change to the height. They stated that every criticism regarding escalator handrails has always been that they are too low, not too high.

The consensus of the Committee was that there may be a safer height for the handrail or one that could improve graspability for children and the elderly but there is no substantial data at this time to support such a change. Therefore, the Committee agreed that this topic should be reviewed further and that the Committee may not have the expertise for such a study. Each member was requested to discuss this issue will their co-workers for more in-depth information and the Committee voted to table discussion on the moving handrail height until the next meeting

At the June 1995 meeting, Mr. Kappenhagen recommended that the Committee ask the A17 International Standards Committee to request the TC 178 WG 5 to discuss the height of the moving escalator handrail in order to achieve a consensus height or provide data for use by the Committee. He noted that he and Mr. Steel are members of the A17 International Standards Committee and will be appointed as delegates to the WG 5.

During the discussion, members questioned why the data provided at the last meeting was not enough to support a change to require the moving handrail to be set at 37 - 42 inches. Mr. Kappenhagen responded that the majority of members at the last Escalator Committee meeting had felt there was not enough information to support a requirement for a specific height. The Committee then voted to send to the International Standards Committee a recommendation to request ISO TC 178 WG 5 to discuss the height of the moving escalator handrail in order to achieve a consensus height or provide data for use by the Committee. {Not Approved - 2 (White, Hayes)}

At the October 1995 meeting, the Chair explained that he and George Kappenhagen will be attending the first meeting of the ISO TC 178 WG 5 later in the month and plan to discuss this issue. It was also noted that B44 contains requirements for handrail heights so the issue will most likely come up during harmonization. Therefore, no action is required by the Escalator and Moving Walk Committee at this time.

At the January 1996 meeting, it was reported that B44 has an item concerning handrail heights which will be discussed as part of harmonization. Additionally, the Committee is awaiting input from the ISO TC 178 WG 5 on this item.

Apr 96: Mr. Steel stated that the Committee may be able to complete this item during harmonization depending on when the information from ISO/TC 178 WG 5 is received. This item, together with Item 10.1, was then tabled to allow for review by the Canadian Representatives.

July 96: This item was not discussed.

Oct 96: The Committee agreed to defer discussion on this item until Mr. Kappenhagen could be present.

Jan 97: The B44 Executive Committee proposal to adopt the wording from B44 Clause 8.3.4.5 as new Rule 802.4e was tabled at the April 1996 meeting.

At the January 1997 meeting, after the item was "untabled", the Committee discussed the proposal from the B44 Executive Committee to adopt B44 Clause 8.3.3.7 as a proposed new rule 802.3j together with a proposal from the B44 Executive Committee to adopt B44 Clause 8.3.4.5 as proposed new Rule 802.4e. See Item 10.1 of these minutes for additional information.

During the discussions, Messrs. Steel and Kappenhagen reported that the ISO TC 178 WG 5 was discussing the subject of handrail heights, and recommended the Committee await the outcome of the WG 5 discussions before proposing a rule for inclusion in the harmonization tabulation. It was noted that the issue of height of the moving handrail is separate but somewhat related to the issue of the external

one single building code to replace the three model codes, and the Code Coordination Committee has volunteered to draft the elevator requirements for the combined building code, the representatives suggested that the proposed rule for the stationary guardrail be included in the draft and considered further by the A17 Code Coordination Committee at their next meeting.

At the October 1995, January 1996, April 1996, July 1996, and October 1996 meetings, this item was not discussed as the Committee was awaiting input from the Code Coordination Committee.

Jan 97: The Committee reviewed a proposal from the B44 Executive Committee to adopt B44 Clause 8.3.3.7 as a proposed new rule 802.3j together with a proposal from the B44 Executive Committee to adopt B44 Clause 8.3.4.5 as proposed new Rule 802.4e. See Item 10.2 of these minutes for additional information.

Regarding the external barricade, it was reported that the item was sent to the Code Coordination Committee for a recommendation; however, the Code Coordination Committee has not met in recent times due to a harmonization effort among the model building codes to create one harmonized building code.

In conclusion, most members were in agreement that the external barricade item is outside the scope of A17, and that 8.3.3.7.1 should not be included in the harmonized code. Messrs. McColl and Fisher were requested to discuss this subject again with the B44 Executive Committee to try to convince them that the subject should be addressed by the building code and not the harmonized elevator code.

May 97: During the discussion, a majority of members again indicated that they believed the external barricade to be outside the scope of the A17.1 Code, and noted that the 915 mm requirement of Clause 8.3.3.7.1 was now included in new Rule 802.4e; others felt that the harmonized code should contain requirements similar to B44 Clause 8.3.3.7. A motion was made and seconded to omit the B44 Clause 8.3.3.7 from the harmonized draft.

VOTED: to omit B44 Clause 8.3.3.7 from the proposed A17.1/B44 Binational Code {Approved-8; Opposed-5 (Burge, Hadaller, Hayes, Vlahovic, Welch)}

Following the vote, the committee agreed to recommend to NEII that the NEII Vertical Transportation Standard be updated to reinforce to architects the need for protection of floor openings, and to include this recommendation as part of the rationale for not accepting Clause 8.3.3.7. See Clause 8.3.3.7 of the June 1997 Part VIII Tabulation for the complete rationale.

The Committee is still awaiting a recommendation from the Code Coordination Committee as to the proposal for the Building Codes to include a requirement for a stationary guardrail.

Discussion:

The A17 Code Coordination Committee met on July 1 and voted to submit the proposal shown in **Attachment 4** as part of their comments on the Draft International Building Code.

10.2 Height of Moving Escalator Handrail

Background:

{See also Attachment 8 of the April 1996 minutes}

At the March 1995 meeting, the Committee discussed the proposal shown in Attachment 8 (page 2/25) of the April 1996 minutes, which Mr. Kappenhagen developed based on his research. Several members

Mr. Steel then asked the members to review the draft and submit any comments they may have for discussion at the next full Escalator Committee meeting. George Kappenhagen, who will serve as liaison between the two Committees, will then reiterate our concerns to the Earthquake Committees.

Jan 96: George Kappenhagen reported that he will discuss at the Earthquake Committee meeting the Escalator Committee concerns raised at the October 11 meeting.

The Committee then discussed the draft and voted to send the following comments/questions to the Earthquake Safety Committee:

(1) The Escalator and Moving Walk Committee requests data for the extent of restraints in escalator support that the escalator should be designed to protect against; i.e. what do the escalators have to tolerate?

(2) In the recent earthquakes, many of the escalators lost their glass either from the motion or from debris. The Escalator Committee is concerned about glass balustrades in high seismic areas and thinks the Earthquake Safety Committee may want to consider prohibiting glass balustrades in certain seismic zones.

The Committee then voted to send the above comments/questions to the Earthquake Safety Committee.

Apr 96: Mr. Steel reported that the Earthquake Safety Committee reviewed this item at their February 1996 meeting. Unfortunately, Mr. Kappenhagen, the liaison between this Committee and the Earthquake Committee, was unable to attend due to an illness; however, Mr. Steel did attend.

The Chair explained that the Earthquake Safety Committee does not have any significant documentation on what has happened to escalators in earthquakes and will try to obtain reports on damage to escalators in recent earthquakes.

The Earthquake Committee concluded that it is more important to protect against immediate injury to passengers than to damage to equipment which may happen some time after the earthquake due to wear. They will concentrate on developing requirements to retain the escalator supports so they do not fall off the building supports and for the reinforcement of the handrail system.

Mr. Kappenhagen then reported that he had obtained a free document from the NEHRP Hazard Reduction Program which provides non-technical information about what the rules require. Members found the document interesting and Mr. Kappenhagen volunteered to obtain more copies and forward them to the Earthquake Safety Committee.

July 96: This item was not discussed.

Oct 96: The Committee agreed to defer discussion on this item until Mr. Kappenhagen could be present.

May 97: See **Attachment 5** for the discussions that took place at the Earthquake Safety Committee meeting of February 1997

Mr. Steel explained that he attended the last meeting of the Earthquake Safety Committee, where he was given the assignment to prepare a draft for review by the Earthquake Safety Committee. Mr. Kappenhagen also attended the Earthquake Safety Committee meeting.

Discussion:

barricade; however, the external barricade is outside the scope of A17.1 while the handrail height can be covered in A17.1.

After further discussions, a motion was made and seconded to adopt 8.3.4.5 as new Rule 802.4e. During the ensuing discussion, it was noted that all manufacturers are producing handrails in the 920 mm to 980 mm range, so the B44 range of 810 mm to 1070 mm is too broad. It was also noted that CEN currently requires 1100 mm but is considering dropping to 1000 mm. The motion to adopt Clause 8.3.4.5 as new Rule 802.4e was then amended by raising the lower range from 810 mm to 900 mm. The members agreed that the minimum should not be raised any higher than 900 mm at this time so as not to arbitrarily exclude other manufacturers. Once input is received from WG 5, the Committee can review the subject further, and perhaps decrease the range. It was then VOTED to adopt 8.3.4.5 as Rule 802.4e, replacing the lower range of 810 mm with 900 mm (35 in.) {Abstained - 1 (S.Fisher)}.

May 97: The Committee is awaiting the results of the ISO TC 178 WG5 discussions.

Discussion:

Messrs. Steel and/or Kappenhagen are asked to report.

11 COMB-STEP IMPACT DEVICES, RULE 805.1u (TR 95-14)

The ASME Board on Hearings and Appeals denied Mr. Verschell's request for an appeal on this item. The item was recently submitted for public review and will be submitted to the Board on Safety Codes and Standards, along with the rest of the items approved for A17.1a-1997.

12 SEISMIC REQUIREMENTS FOR ESCALATORS AND MOVING WALKS

Background:

Jun 95: Mr. Kappenhagen reported that he had prepared a draft for new requirements in Part XXIV for escalators and moving walks which he submitted to the A17 Earthquake Committee. He stated that there is a concern for bolt snapping whenever both ends of the escalator or the moving walk truss are secured to the building structure. The trusses cannot withstand the forces subjected to the building structure and the bolts snap.

The Earthquake Committee reviewed the draft and recommended that it be forwarded to the Escalator and Moving Walk Committee for comment and with the advise that they look only at the content, not the calculations, as the Earthquake Committee must resolve the seismic zone classifications issue before reviewing the calculations. They also asked Mr. Kappenhagen to be the liaison between the two committees and he agreed.

Mr. Kappenhagen then requested that the draft be included in the minutes of this meeting and the agenda of the next meeting so that members could review it for a discussion at the next meeting. See Attachment 11 of the January 1997 minutes for the draft.

Oct 95: Mr. Kappenhagen referred the Committee to the draft (Attachment 11 of the January 1997 minutes) and explained that the Earthquake Committee has asked the Escalator and Moving Walk Committee to review the draft and submit to the Earthquake Committee any comments or suggestions they may have. The Escalator Committee should only review the contents of the draft, not the calculations, since the Earthquake Committee must resolve the seismic zone classifications issue before reviewing the calculations.

Discussion:

The Task Force is requested to report.

15 LOW FRICTION, RULE 802.3f (TR 96-64)

Background:

TR 96-64 was opened to address the issue raised in Question 3 of Inquiry 96-42:

Inquiry 96-42

Committee: Escalator and Moving Walk

Subject: Rule 802.3f
Skirt Panels

Edition: A17.1-1993 including A17.1b-1995

Question(s):

Skirt panels must be made of low friction materials or be treated with friction reducing materials. No definition or objective criteria is given for low friction. The only interpretations given so far is that certain materials, such as stainless steel, are not low friction.

In an article published in Elevator World in April 1982 (Volume 4 of the Educational Package and Reference Library) the Liberty Mutual Research Center determined that Teflon, whether factory applied or sprayed on, is not an appropriate material for reducing skirt panel friction. These results were presented to the A17 Escalator Committee.

(1) Is a lubricant, either factory applied or sprayed on, a "low friction" or "friction reducing" material?
(2) If so, what is the criteria being used to determine this?
(3) For factory applied materials in general, how do you determine if wear or damage has caused a skirt panel to no longer be low friction?
(4) How often must friction reducing materials be applied?

Answer(s):

(1) Yes
(2) To apply a lubricant to reduce the friction below that of the base material that was currently used in skirt panels
(3) The Code does not address this issue.
(4) The Code does not address this issue. See also Inquiry 87-2, Question 2

Oct 96: It was noted that this item should be reviewed at the next meeting when the committee performs a review of the open items regarding the Part VIII harmonization.

Jan 97: Mr. Steel explained that the CPSC has requested that the manufacturers perform a study to prevent entrapments. As a result, NEII, with cooperation from the major manufacturers, is preparing a study to develop an index to take into account (1) the coefficient of friction; (2) the skirt/step clearance; and (3) the stiffness of the skirts, all of the items which add to something getting caught between the skirt and step under reasonable use. It is hoped that the study will find some way of measuring and quantifying the escalator to determine if it will prevent entrapment, taking into account the three above items. If the study works, there will be no need to define friction.

Mr. Steel suggested the Committee await the results of the study rather than trying to draft a proposal immediately for inclusion in the harmonization package. Once the results of the NEII study are available, the Committee should be able to develop performance oriented rules to prevent entrapments. It is anticipated that the results of the study will be available by the end of the year. It was further reported that NEII is attempting to find an outside group to perform the actual study.

A motion was made, seconded, and VOTED to table this item to await the results of the NEII study {Opposed - 1 (Hayes), Abstained - 1 (Welch)}.

May 97: This item was tabled at the previous meeting to await the results of the NEII study.

13 COMB-STEP IMPACT DEVICES FOR MOVING WALKS, Rule 905.1r (TR 95-70)

The proposal was submitted to the Main Committee for letter ballot consideration at their January 1996 meeting. Several objections and comments were received. See **Attachment 6**. The Committee subsequently tabled this item to await the outcome of Mr. Verschell's appeals on TR 95-14.

14 INSPECTION AND SERVICE SWITCH

Background

July 96: This item was not discussed.

Oct 96: The Secretary noted that the first proposal in **Attachment 7** is related to a proposal submitted by Mr. Hayes (TR 96-54). {Note: TR 96-54 was subsequently tabled. See Item 21 of the January 1997 meeting Minutes for details}.

Jan 97: See **Attachment 7, First Proposal.** At the January 1997 meeting, Mr. Fisher explained that the B44 Technical Committee recommends the adoption of the proposed Clause 8.6.19 shown in **Attachment 7**, even though it is not currently addressed by A17.1 or B44.

A motion was made and seconded to adopt proposed Clause 8.6.19. During the ensuing discussion, members of the Committee indicated that they felt the proposal effectively would provide a designed-in jumper. The proposed switch would encourage a service mechanic to "jog" an escalator while observing from within the step band. The members felt the whole proposal would encourage an unsafe practice. The Code currently requires a stop switch in the machinery space (8005.3e) which the mechanic can use. The mechanic can always jog the switch by using the key. This give total control to the mechanic working on the equipment. Others were opposed to the motion because the requirement is not currently in A17.1 or B44 and felt it should be tabled until after harmonization.

The motion to adopt proposed Clause 8.6.19 failed {Approved -0; Opposed - 12; Abstained -1 (Hayes)}.

May 97: Mr. Hadaller distributed the proposal shown in **Attachment 8.** He explained that the B44 Technical Committee was upset that this committee did not approve the proposal submitted at the previous Escalator Committee meeting and had submitted the proposal for letter ballot approval of the B44 Technical Committee. The attachment includes the results of the B44 letter ballot. He then requested that the Committee reconsider the proposal.

The members then reviewed the proposal. During the ensuing discussions, some members reiterated their concern that the proposal would encourage an unsafe practice. Those in favor of the proposal felt it would prevent accidents of inadvertant starting of escalators by mechanics when attempting to position the escalator during maintenance and repairs. Some members agreed with the intent of the device but felt the proposal should be rewritten as a maintenance device, not a safety device, and that the device should be permitted rather than required.

A motion was made and seconded to incorporate proposed new Clause 8.6.19 as shown in **Attachment 8** into the harmonization tabulation. The motion failed {Approved- 5 (only Mr. Hayes asked to be recorded); Opposed- 8; Abstained-0}.

A Task Force was then set up to develop a new proposal for review by the Committee. The following members were appointed to the Task Force: George Kappenhagen, Patrick Welch, Joe Kenneally, Tom Nurnberg, and Roland Hadaller. The Task Force expects to prepare a proposal by the end of August. If their proposal is approved by the Escalator Committee, it could be inserted into the harmonization proposal during resolution of ballot comments.

Mr. Steel reported that NEII has selected a contractor for the project and provided the contractor with detailed instructions. It is anticipated that a contract will be signed. Once that is all settled, the contractor will be given 120 days to complete the study.

Discussion:

Mr. Steel is asked to provide an update.

16 INSTRUCTIONS FOR HAND-WIRING DEVICES (TR 96-53)

Background:

See **Attachment 9** for a proposed new Rule from Hubert H. Hayes concerning instructions for hand wiring.

Oct 96: The Committee agreed to include this item in harmonization but to defer discussion on the item until the next meeting to allow for review of Mr. Hayes' proposal.

Jan 97: Mr. Hayes explained the intent of the proposal shown in **Attachment 9**, for hand wiring devices.

After hearing the discussion, Mr. Steel indicated that the proposed wording was similar to that of EN 115 for hand winding devices.

Mr. Hayes agreed to review his proposal and report back at the next meeting.

May 97: Mr. Hayes stated that he will report at the next meeting.

Discussion:

Mr. Hayes is asked to report.

17 NEW BUSINESS

17.1 Handrail Clearance, Rule 802.4f

Background:

During the harmonization discussions regarding Rule 802.4f, Mr. Rehman explained that B44 Clause 8.3.4.6 was added to the Code in 1994 and is the basis for the harmonized Rule 804.4f shown in the tabulation. He indicated that recently, he and others have encountered problems with the enforcement of B44 Clause 8.3.4.6.

It was then suggested that perhaps a revision could be added to Figure D1 showing a 10 mm maximum on either side; however, others did not agree with this suggestion as the rule permits a maximum total of 10 mm, not 10 mm on each side.

Because no definitive proposal was developed, it was agreed to leave the proposed rule 804.4f as shown in the tabulation and to open this TR to review the rule at a later date.

Discussion:

17.2 Entrapment of Fingers Under the Handrail - Between Handrail and Handrail Stand

Background:

The Inspectors' Manual Committee reviewed the NEII letter shown in **Attachment 10**, dated May 27, 1997 and is seeking input from the Escalator and Moving Walk Committee.

Discussion:

17.3 Escalator Brake Testing at Acceptance Inspection

Background:

At their May 7-9, 1997 meeting, the Inspectors' Manual Committee reviewed proposed harmonization Rule 1003.2b(4)(c)(1) shown below.

Rule 1003.2b

(4) ~~1008.2d~~ Drive Machine and Brake. The drive machine and brakes shall be inspected and tested including test of the brake torque (~~Rules 804.3 and 906.3; and~~ Items 2.4 and 4.4).

(a) Connection of machine and drive shaft (Rule 804.1 or 904.1);

(b) Drive motor (Rule 804.2);

(c) Brake type (Rule 804.3 or 904.3):

(1) Brake test: brakes shall be tested to determine conformance with the requirements of Rule 804.3a; or

(2) If the type test certificate exists (see Rule 1105.1), it shall only be necessary to verify the setting on the data plate or in the special instructions (see Rule 804.3a(4) for escalators and 904.3a(4) for moving walks).

(d) Brake data plate (Rule 804.3a(4)); and

(e) Main drive-shaft brake (Rule 804.3b).

This proposed rule is part of the Acceptance Inspection for Escalators and is based on current B44 wording.

The Inspectors' Manual Committee questioned why Rule 1003.2b(4)(c)(1) is necessary since all escalator brakes on new equipment will be required to be type tested before they are inspected and is seeking input as to whether the Escalator Committee agrees that the rule is not necessary.

Discussion:

18 FUTURE MEETINGS

The Committee has not yet scheduled their next meeting.

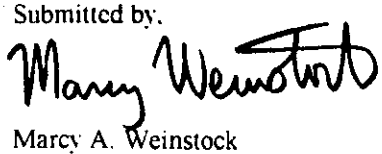
For your information, the following A17 Main Committee meetings have been scheduled:

Sept. 23, 1997	Vancouver
January 12-16, 1998	Palm Beach Gardens, Florida
March 30 - April 3, 1997	Denver, CO
June 22-26, 1997	Charlotte, NC

19 ADJOURNMENT

The meeting is scheduled to adjourn at 5:00 p.m. on Wednesday, August 27, 1997.

Submitted by,



Marcy A. Weinstock
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FAX.(416)332-8276
COM.EXP. 12/1999
SRI# 5043880

TOTAL L01030700 - 33

the horizontal should be removed and it should only be vertical similar to what New York City has. I believe that this is in the best interest of the public.

Comments

G. Kappenhagen:

I certainly agree with the need to increase the forces, however the reason is incorrect as stated since data was obtained on escalators. The reason should begin with: "Experience backed up by extrapolating data obtained from escalators indicate..."

Montréal ▪ Toronto ▪ Edmonton ▪ Vancouver ▪ Tokyo ▪ Hong Kong ▪ Singapore

File No. S152-90

April 18, 1996

ASME International
345 East 47th St
New York, N.Y. 10017-2392
USA

Attention: Marcy A. Weinstock

Dear Marcy:

At the 1995 Annual meeting of the B44 Technical Committee, the following two proposals were made, with the recommendation that they be forwarded for review by the B44/A17 Escalator Committee:

First Proposal

Add new Clause to B44 (and equivalent rule to A17.1)

8.6.19 Inspection and Service Switch
A switch shall be provided in each machinery space where means of access to the space is provided, that when actuated, will open the self-holding circuits of the driving machine motor and brake running relays. The switch shall be:
(a) of the manually opened and closed type;
(b) conspicuously and permanently marked to identify the "inspection" and "run" position;
(c) positively opened mechanically; this opening shall not be solely dependent on springs.

Rationale for proposed new Clause 8.6.19 Escalator Inspection and Service Switch:

The intent is to prevent accidents through inadvertent starting/running of escalators by mechanics when attempting to position escalators in order to check/adjust/repair components as becomes necessary from time to time by providing a switch for use during maintenance and repairs that will prevent the escalator from running unless the key switch (start switch) is manually held in the On position.

During the summer of 1995 two accidents occurred in Alberta.

1. Serious injury resulted when a mechanic slipped from the escalator landing plate into the step band where some steps had been removed while attempting to position the escalator using the normal start/stop station switches to check for wear. The escalator went into the "run" mode because, when he slipped, he was unable to actuate the stop switch. Fortunately,

his helper was working directly in front of the disconnect switch and shut the escalator off very quickly. While the mechanic was severely crushed, he survived the ordeal.

2. Death resulted when a mechanic was standing inside the step band where some steps had been removed. It appears he attempted to position the escalator to make some checks using the normal stop/start station switches when he lost his hold on the switches. The escalator went into the "run" mode.

The mechanic's body was caught between the combplate end of the landing plate and the steps running up from behind him. His body was severed just below the chest. He died almost instantly.

2nd Proposal — Tabled at Jan '97 ESC Comm Mtg

Introduce pit drain requirements for escalators and moving walks similar to those approved for elevators (see following Clause for elevators).

Revise Clause 2.7.1.2

Pits extending to the ground or below shall have noncombustible floors, pit drains and shall be designed to prevent entry of ground water into the pit, or the accumulation of fluids from any other source.

I would appreciate it if you could place the above two proposals on the agenda of the Joint Escalator Committee to be held on April 23, 1996.

Yours very truly,

H

Husam Mansour
Project Manager
Life Sciences

(416) 747 4233

Fax 747 2473

jh/-

c.c. B44 Executive Committee

M8.1.5 **New Clause 8.6.19 Inspection and Service Switch**

APCEI Recommendation

We propose that a new clause be added to Section 8, Escalators. This Clause will read as follows:

8.6.19 Inspection and Service Switch
A switch shall be provided in each machinery space where means of access to the space is provided, that when actuated, will open the self-holding circuits of the driving machine motor and brake running relays. The switch shall be:
(a) of the manually opened and closed type;
(b) conspicuously and permanently marked to identify the "inspection" and "run" position;
(c) positively opened mechanically; this opening shall not be solely dependent on springs.

Rationale for proposed new Clause 8.6.19 Escalator Inspection and Service Switch:

The intent is to prevent accidents through inadvertent starting/running of escalators by mechanics when attempting to position escalators in order to check/adjust/repair components as becomes necessary from time to time by providing a switch for use during maintenance and repairs that will prevent the escalator from running unless the key switch (start switch) is manually held in the On position.

During the summer of 1995 two accidents occurred in Alberta.

1. Serious injury resulted when a mechanic slipped from the escalator landing plate into the step band where some steps had been removed while attempting to position the escalator using the normal start/stop station switches to check for wear. The escalator went into the "run" mode because, when he slipped, he was unable to actuate the stop switch. Fortunately, his helper was working directly in front of the disconnect switch and shut the escalator off very quickly. While the mechanic was severely crushed, he survived the ordeal.

2. Death resulted when a mechanic was standing inside the step band where some steps had been removed. It appears he attempted to position the escalator to make some checks using the normal stop/start station switches when he lost his hold on the switches. The escalator went into the "run" mode.

The mechanic's body was caught between the combplate end of the landing plate and the steps running up from behind him. His body was severed just below the chest. He died almost instantly.

Recommendation by the B44 Committee

The Technical Committee approved the proposal in principle and agreed to forward it to the B44/A17 Escalator Committee for review and comments.

Action by B44 Executive

Action by S.Fisher/ Secretary — It was agreed that S. Fisher will submit the recommendation to the B44/A17 Escalator Committee.

**Proposed amendments Clause 8.6.19(New) to CAN/CSA-B44-94,
Safety Code for Elevators
(February 1997)**

1. Clause 8.6.19(New) - Add the following clause:

A switch shall be provided, in each machinery space where means of access to the space is provided, that when actuated, will open the self-holding circuits of the driving machine motor and brake running relays. The switch shall be
(a) of the manually opened and closed type;
(b) conspicuously and permanently marked to identify the "inspection" and "run" positions; and
(c) positively opened mechanically; this opening shall not be solely dependent on springs.

Rationale: The intent is to prevent accidents through inadvertent starting/running of escalators by mechanics when attempting to position escalators in order to check/adjust/repair components as becomes necessary from time to time by providing a switch for use during maintenance and repairs that will prevent the escalator from running less the key switch (part switch) is manually held in the On position.

Note: *The above proposal was prepared by the Association of Provincial Chief Elevator Inspectors in response to two accidents that occurred in Alberta. The proposal was approved for letter ballot by the B44 Technical Committee at its 1996 Annual Meeting. Once the new clause is approved, it will be published in the form of an amendment to the B44-94 edition.*

File No. S152-90

Letter Ballot Summary

Result of Voting on Ballot No. 64 **Ballot Closing Date** March 21, 1997

Technical Committee on Elevator Safety Code

Re: Proposed amendments Clause 8.6.19(New) to CAN/CSA-B44-94, Safety Code for Elevators

Date Issued February 21, 1997 **No. of Members** 34

Item	Approval Votes	Disapproval Votes	Abstain	No Reply	Meets # of Required Approval Votes 50% x 34 = 17 2/3 x 22 = 15
	21	1 D McColl		12 Bolduc Brown Burr Duma Griffin Hollet Holmes Lamoureux Marsiglio Rehman Virk White	
Responses Received After Closing Date *Note: Please include name and date received.*					
Total	21	1		12	

Comments:

P Labadie - The rationale intent is well understood; however, there are a few words missing and a few mistakes in the text.

S Fisher - This is definitely a step in the right direction and I fully agree with intent... However, I think the Code should in fact go further and specify, separate operating devices be provided which include a stop switch directional buttons and an enable button in addition to the (insp/jogging) transfer switch being provided; and when in effect, all other operating devices shall be rendered ineffective ... (pendant cords should be permitted as well as plug-in type switchover type arrangements in lieu of transfer switches).

Summary of LB # 64 (cont'd)

Comments (cont'd)

S Fisher (cont'd)

If plug in type devices are provided, and more than one plug-in location is provided, the circuits shall be so arranged so as to prevent any operation if more than one operating device is connected.

The operating device shall be kept on site with escalator controller (possibly require interlocking with docking station/plug which would prevent escalator operation if device is not in position ...)

Note: The plug-in type device arrangement would possibly provide the best flexibility of use, as well as positive operation transfer means eg, require removal of normal operation jumper plug (which would remove self holding feature and disable normal starting means, positively) to allow plug in type operating device to be plugged in.

Definitely some form of inspection/jogging operation must be made mandatory by the code to enhance safety.

L Boudreau - **Rationale**: ... 4N less the key switch (start ~~part~~ switch) ...

SJ Koinoff - 8.6.13.1 Stop and Inspection Switches in Machinery Spaces

8.6.13.1 Stop Switch

8.6.13.2 Inspection Switch
An inspection switch shall be provided ...

Rationale: Extremely important to have clear, effective wording - establish Inspection Switch vs Stop Switch, both are in machinery space.

D McColl (Disapproval) - letter attached.

Administrative Assistant: J. Halge

Submitted to: H. Mansour
Date: March 24, 1997

For completion by SA where the SSC has conducted the SLR balloting:
This project was formally approved (technical and second level) on (Date):_____
Please ☐proceed ☐do not proceed to Production for final publication.

SA: ___ Submitted to: _J. Halge_____ cc: Planner

Otis C
710 Do
Oakvill
L6K 3V7

March 21, 1997

Mrs. Jackie Halge,
Administrative Assistant,
Standards Development,
Canadian Standards Association,
178 Rexdale Blvd.,
Etobicoke, ON.
M9W 1R3

Dear Jackie;

Re: Letter Ballot 64 - Proposed Clause 8.6.19

I disapprove of the above mentioned proposal for the following reasons:

1. The proposal is incomplete. When the switch is in the "Inspection" position what operation is meant to occur? There is no mention of "Inspection" operation, switches or operating devices anywhere else in Section 8.
2. The switch is not labelled. It should be labelled the same as the "INSPECTION" switch in the proposed Rule 210.1d(1) of the A17/B44 Binational Code.
3. It is not clear which position the switch will be in when actuated.
4. There is no requirement elsewhere in Section 8 for driving machine motor and brake running relays. Does this clause not apply if other types of devices are used to actuate the motor and brake?
5. In the rationale what is meant by (part switch)?
6. This proposal goes against the spirit of Harmonization. While I support a requirement of this type, we should not be publishing an amendment to the B44-94 requiring a device which is not required in A17.1, in the middle of the Harmonization process. It is incumbent upon the B44 Technical Committee, through the Executive Committee, to ensure that the Joint Escalator Committee understands their concerns and that a **harmonized** proposal for this requirement appears in the A17/B44 Binational Code. A proposal correcting the above deficiencies should be presented and reviewed by the Joint Escalator Committee at its next meeting (May 14-15, 1997).

Yours truly,

OTIS CANADA INC.

David McColl, P. Eng.,
Manager, Codes & Product Safety,
Canada

HUBERT H. HAYES, INC.
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TR96-53

Secretary, A17 Committee
ASME
345 East 47th Street
New York, New York 10017

July 8 1996

Edition: 1993 A17.1 & 1993 A17.3

Subject: Add New Rule To Part 8xx Instructions for hand-wiring devices
Rule 8xx.x
If a hand-wiring device is provided, corresponding instructions for use shall be available in the vicinity and the direction of travel of the escalator or moving walk shall be indicated clearly.

Reasons: To Keep Inspector & Service Man Safe

Hubert H. Hayes Inc.

Hubert H. Hayes President

National Elevator Industry, Inc.

ASSOCIATION HEADQUARTERS:
185 Bridge Plaza North • Room 310 • Fort Lee, New Jersey 07024 • (201) 944-3211 • Fax: (201) 944-5483

RESPOND TO: **Edward A. Donoghue Associates Inc.**
Code and Safety Consultant to NEII
1677 County Route 64, P. O. Box 201
Salem, NY 12865-0201
500.442 CODE or 518.854.9249
Internet E-mail: eadai@ibm.net

May 27, 1997

Mrs. Geraldine Burdeshaw, Secretary
ASME A17 Main Committee
American Society of Mechanical Engineers
345 East 47th Street
New York, NY 10017-2392

Subject: Technical Revision ASME A17.2.3

Dear Geraldine:

A NEII member request the following technical revision be made to ASME A17.2.3.

Subject: Item 1.3.1
External Inspection and Test of Escalators - Top and Bottom External Inspection
Item 1.3 Handrails

Edition: A17.2.3-1994 to Present

Problem: The referenced Item in the third sentence states: "The undersides of the handrails should be close enough to the handrail stand to prevent any fingers from getting between the handrail and the handrail stand".

There are several problem with this item, the first of which is the arbitrariness of "any fingers", the second of which is the fact that there is no such thing as a "handrail stand" defined in the A17 Code, and most important of which is that this inspection is for something that is not even covered in A17.1. The inspection procedure should be eliminated from A17.2.3.

Suggest the following: 1) Eliminate this provision from Item 1.3.1.
2) Inspection requirements should be coordinated with the A17 Committee responsible to assure that requirements for items not cover in the Code are not called for.

Very truly yours,

Edward A. Donoghue

Edward A. Donoghue, CPCA
Code and Safety Consultant to NEII

jmd

cc: K. Lloyd
J. Pang
NEII Members ASME A17 Committee

File:May97.27DNEII

United States
CONSUMER PRODUCT SAFETY COMMISSION
Washington, D.C. 20207

Office of
Information & Public Affairs

MEMORANDUM

DATE: September 2, 1997

TO : Ron Medford, EXHR

FROM : Elaine Tyrrell

Elaine
Thoughts from several
ES staff attached
Andy

SUBJECT: CDC National Bicycle Ad Hoc Working Group to Prevent Traumatic Brain Injury meeting

Here is some feedback from the meeting last Friday and a request for assistance.

First, they want to get rid of the Ad Hoc part of the title, but no concrete decisions have been made beyond that. The name that may be used is "Technical Advisory Board for Bike Safety".

The CDC has developed a Web site for the committee and used a facilitator at Friday's meeting to revisit the mission of the committee (since Rich Schieber is the new chairman & has only been involved with the committee since March, 1997). The committee reached consensus on the following:

- The committee will function for bicycle specific issues (versus expanding to include all head trauma causes, regardless of product involved).

- The committee agreed that the purpose of the committee is to promote bike safety and increase safe use of bicycles (prevent bike injuries, promote bike safety education, and increase information sharing).

I will share the minutes of the committee meeting with you when they arrive from CDC.

By COB tomorrow, September 3, I ask that the bicycle technical staff look at the attached 2 pages for the committee's Web site. This is how the bike page will look with the left frame showing a listing of topics and the right frame giving the title and description of the committee. **Please identify other topics, if any, that should be added to the list.** I suggested a heading of "regulations" which they will add. The other

Reports of accidents/incidents to NHTSA

handwritten topics were suggested by other committee members and will be added.

A heads up - I have a CPSC presentation on the bike light/reflectivity project scheduled for the next meeting of the committee - December 2, 1997, at 9 am. The meeting will be at DOT.

Attachment(s)

cc: Bob Frye
Murray Cohn

Mark Kumagai
Please plan on it!!

(This page is only a draft) Name this Page!!

Bicycle

Who are we?

What are our activities?

Our mission statement

The National AD Hoc Working Group to prevent Traumatic Brain Injury invites you to help us reduce all deaths and injuries resulting from bicycle-related injuries. Check out our pages, wear your helmet. and have fun biking!

Please send comments to *Rich Schieber*

- The Bike Hub
- Bike Safety Hub

Safe Biking

Helmets

Biomechanics

Epidemiology Bike injury Data

Programs should be published

~~Program Evaluation~~ ? a better term is effectiveness evaluation and field surveys

Legislation -

Education

Co-operative Agreements

Traumatic Brain Injuries

Publications -> should have link to CPSC bike safety pubs @ our web site.

Other Bike Links

To share each other's Constituents.

Regulations and Standards

Kids ~~Page~~ Biz

Protection

Tech. Assistance

Funding

Photo Gallery.

If you had an accident. - This should encourage those who had or know of someone who has been in a bike accident w/or w/out a helmet to ① fill out a questionnaire on-line ② send their helmet to CPSC, the mfr and/or contact Safe Kids

Suggestions for web site sponsored by CDC Committee to prevent TBI

When you "click" on Helmets, you should get detailed information on:

1. How a helmet works. (This also may be covered under the Biomechanics heading on the Safe Biking page.)

2. What standards to look for.

3. Instructions on how to choose a helmet size and adjust the straps to obtain a proper fit.

S. Heh
ESME
9/2/97

- If this Web site is intended for the consumers should have basic safe riding practice
- 10 steps to safe biking could be used as a guide

Mark Kyzar
9/2/97

A17/B44 Escalator and Moving Walk Committee
Attendance Record

Member	Meeting Dates									
	5/97	1/97	10/96	7/96	4/96	1/96	10/95	6/95	3/95	12/94
Bolduc. G	A	X	X	X	-	-	-	-	-	-
Burge. P	X	A		A	X		X	-	-	-
(Rehman. A)	X		X		X	X				
Callis. R	A	X	X	A	X	A	X	X	X	X
(Dengs. B)										
Carrajat. P	A*	A	A*	A	X	A	X	A	X	X
Caster. T	A	A	A	A	A	X		X	X	-
(Fox. C)							X	X		C
DiPiero. R	C	C	C	X	C	C	C	-	-	-
Fisher. S	A	X	X	X	X					
Grainer. S	A	A	A	X	A	-	-	-	-	-
(Haruta. Y)										
Hadaller. R	X	-	-	-	-	-	-	-	-	-
Hayes. H	X	X	X	X	X	X	X	X	X	X
Heintschel. R	C	C	C	C	C	C	C	C	C	C
Kappenhagen. G	X	X		X	X	X	X	X	X	X
(Meehan. M)			X						X	
Kenneally. J	X	X	-	-	-	-	-	-	-	-
Kraft. J	C	C	C	X	C	C	C	C	C	C
Liberatore. C	-	-	-	-	-	-	-	-	-	-
Marcusky. J	A	X	X	A	X	A	X	A	X	X
Matsui. T	C	C	C	C	C	C	C	A*	A	A*
McColl. D	X	-	-	-	-	-	-	-	-	-
Moskal. T	A		X	X	X	X	X	X	A	X
Nurnberg. T	X	X	-	-	-	-	X	X	X	X
Parvis. E	X	X	A*	A*	X	X	X	-	-	-
(Apperson. K)										
Schaeffer. R	X	X	X	X	X	X	X	X	X	X
Steel. D	X	X	X	X	X	X	X	X	X	X
(McClement. A)		X			X		X			X
Turner. D	-	-	-	-	-	-	-	-	-	-
Vlahovic. C E	X	-	-	-	-	-	-	-	-	-
Welch. P	X	X	-	-	-	-	-	-	-	-
White. C	A	A	A	X	A	X	X	X	X	X

KEY: X = Present
A = Absent
- = Not Member at time of meeting
C = Corresponding Member
NOTE: * Sent representative

INQ 97-26

Section 805 (A17.1 - 1996)

Escalator Phase Reversal

The A17.1 Code requires phase reversal protection of elevators but does not require it of escalators. The N.E.C. does not require phase reversal protection for either. Please explain why escalators do not need this protection.

SUBMITTED BY
JAMES FILIPPONE

TRs Approved by the A17 Committee for A17.1a-1997

The following TRs have been approved by the A17 Committee; they will be submitted to the ASME Board on Safety Codes and Standards and the ANSI Board of Standards Review and if approved, will be published in A17.1a-1997.

Escalators

Location	TR #	Proposed Revision
805.1u	95-14	Comb Step Impact Device Forces

Moving Walks

Location	TR #	Proposed Revision
902.3h(3)	95-71	Tamper resistant safety barrier attachment fastener heads
903.1	95-73	Speed Attained by an Escalator after start-up (similar to TR 93-63)
905.11	95-72	Addition to prevent the insertion of body parts into the moving machinery at the end of the mw where the handrail is exiting (similar to TR 95-13).

TRs Approved by the A17 Committee for A17.1b-1998

As of July 1997, no Part VIII or Part IX TRs have been approved by the A17 Committee for A17.1b-1998.

SUBMITTED TO THE INTERNATIONAL CODE COUNCIL:

Add the following new Rule to Chapter 30:

3006.2.2 Escalator Guardrails. Every escalator or bank of escalators adjacent to an open wellway shall have a guardrail.

The guardrail shall be a minimum of four (4) inches horizontally away from the moving handrail. This shall be measured from the vertical plane described by the outer surface of the moving handrail and the vertical plane described by the inner surface of the guardrail.

The height of the top surface of the guardrail shall not be less than 42 inches measured vertically above the step noseline on the incline and shall not be less than 42 inches measured vertically above the 2 to 4 flat steps at the landings. A transition at the top and bottom curve shall be based on the geometry of a particular manufacturers design.

The guardrail shall be designed in such a manner as to prevent objects from being caught between the escalator handrail and the guardrail.

Rationale for Proposed new Rule 3006.2.2: There has been an unexpected history of falls over the sides of escalators. While in general it seems most of this is due to "horseplay" or inebriated people not fully aware of where they were or what they are doing. Dr. John Fruin, a highly regarded expert, has pointed out that a 42 inch (1067 mm) minimum guardrail is needed. To protect against potential abuse or reasonable use, depending on ones viewpoint, guard rails should be mandatory where there are open atriums or other spaces. See attached study by Dr. John Fruin.

Although the A17 Committee feels that a requirement for an external guardrail is necessary, the A17 Committee believes it is outside the scope of the elevator code and should be included in the building code. In a related matter, the A17 Committee has proposed the new rule shown below for the height of the moving escalator handrail for inclusion in the ASME A17.1/CSA B44 binational elevator code, however, the proposed new rule is not intended for fall protection but rather, for guidance of passengers riding the escalator.

Proposed Rule for inclusion in ASME A17.1/CSA B44
802.4e Vertical Height. The vertical height from step nose to top of handrail shall be not less than 900 mm (35 in), nor more than 1070 mm (42 in).

18 ESCALATORS AND MOVING WALKS

Background:

Mar 95: Mr. Kappenhagen distributed the draft, ~~shown in Attachment 18~~, for new requirements in Part XXIV for escalators and moving walks. He stated that there is a concern for bolt snapping whenever both ends of the escalator or the moving walk truss are secured to the building structure. The trusses cannot withstand the forces subject to the building structure and the bolts snap. He has found that the problem is not as severe where only one end of the truss is secured.

The Committee decided to forward Mr. Kappenhagen's proposal to the Escalator and Moving Walk Committee for comment and advise them to look only at the content, not the calculations, as the Earthquake Committee must resolve the seismic zone classifications issue before reviewing the calculations.

Feb 96: The Committee decided the best approach for this item is to begin by reviewing the problems that have been encountered in recent earthquakes. Mr. Swerrie reported that the Luoma Prieta earthquake did not cause a substantial amount of damage to escalators; however, the Northridge earthquake caused a lot of buckling and shearing of bolts.

Mr. Gibson then suggested that Mr. Ledesma's video which was shown at the 1994 NAESA Workshop be shown to this Committee. He will try to obtain the video from NAESA. It was also suggested that Mr. Ledesma and/or Dr. Schiff may have written reports covering escalator damage from earthquakes. The Secretary was requested to contact Messrs. Ledesma and Schiff for available reports.

Mr. Steel stated that there was some confusion regarding the origin of the proposal in ~~Attachment 18~~. He was under the impression that it was drafted by the Earthquake Committee and then sent to the Escalator Committee for review. However, now he realizes that Mr. Kappenhagen drafted the proposal and submitted it to the Earthquake Committee who then forwarded it to the Escalator Committee for review. In any event, the Escalator and Moving Walk Committee performed a general review of the proposal (no calculations were discussed), and had some comments for consideration by the Earthquake Safety Committee.

One concern raised by the Escalator Committee was the extent of restraints in escalator support that the escalator should be designed to protect against; i.e. what do the escalators have to tolerate?

Another concern raised by the Escalator Committee was the use of glass balustrades in high seismic zones. The Escalator Committee felt that consideration should be given to prohibiting them.

It was then suggested that rather than prohibiting glass balustrades, consideration be given to requiring external steel mullions to support the handrails. It was further suggested that the Committee discuss this issue with glass experts to find out if there are some principles which can be applied towards the containment of the glass in the balustrades.

Towards the end of the discussion on the protection of escalators from earthquakes, the Committee concluded that the inside of the escalator could not be protected from damage due to an earthquake but an absolute inspection of internal components of escalators after earthquakes should be required to ensure the immediate safety of the passengers.

Mr. Droste suggested that the Committee should review the Japanese requirements for earthquake protection. The Secretary was asked to attach the appropriate requirements to these minutes. ~~See Attachment 19~~

It was also suggested that the Committee consider requiring a seismic switch to shut down the escalator at the onset of an earthquake. It was noted that this will cause an abrupt stop which can cause injury but it should still be considered.

Discussion:

Mr. Kappenhagen distributed copies of the book titled "A Nontechnical Explanation of the 1994 NEHRP Recommended Provisions" and referred the Committee to page 40 of the book which covers drift limits (~~Attachment 20 contains a copy of page 40~~) He explained that the Escalator and Moving Walk Committee is seeking guidance as to the extent of movement in the escalator support that the escalator should be designed to protect against to prevent the escalator truss from falling off the support. The Escalator Committee is also concerned with handrail integrity for glass balustrades.

The Committee discussed the maximum drift. Once the maximum drift is determined, the escalator can be designed to accommodate it. It was then noted that A17 Code should be based on maximum actual drift rather than the design drift. Mr. Schiff responded that he is unsure as to whether the NEHRP guidelines provides means for calculating actual or design drifts and will check and report his findings to the Secretary.

Some members noted that escalators fixed at both ends resulted in greater damage than those fixed at only one end, and that escalators not fixed at either end resulted in even less damage than those fixed at one end. However, it was concluded that it is up to the designer how to accommodate the drift, whether to fix at one end, two ends, or neither.

During the discussion, a concern arose regarding the possibility that an earthquake could produce a drift greater than the maximum drift to which the escalator would be designed, and it was suggested that a redundant structural design to protect the escalator from falling be required.

It was concluded that a supplemental rule (in addition to a rule regarding maximum drift) should be provided for catastrophic failure to prevent the truss from falling.

The following was concluded:

1) acceleration factors from new maps for elevators being provided by Mr. Schiff, will be applied to escalators as well;
2) absolute design story drift will be provided by Mr. Schiff; and
3) a rule covering a catastrophic type support system will be developed

It was then noted that the State of California is also concerned with seismic provisions for escalators; they are adopting A17.1 but are adding requirements for escalators. See **Attachment 21**. Mr. Droste noted that California's proposal is similar to the City of Los Angeles draft distributed with the last meeting minutes covering preliminary recommendations for Non Structural Elements on escalators and moving walks, ~~a copy of which is contained in Attachment 22~~.

The Committee next discussed requirements for handrail integrity for glass balustrades and felt that the California proposed Section 3137(b)(3) which reads "In balustrades which contain glass, glass shall not be part of the structural support system of the handrail " seems reasonable for escalators.

During the discussions, it was noted that the Manufacturers would need time to develop new handrails to meet this requirement, and it was also noted that many, including architects, may not be willing to use handrails with steel supports.

Following the discussions, Mr. Steel agreed to develop a proposal, based on the California Draft and the Committee's discussions, for review by this Committee.

Attachment 2: from Feb 97 Earthquake Minutes

PRELIMINARY RECOMMENDATIONS
CITY OF LOS ANGELES NON-STRUCTURAL ELEMENTS
SUBCOMMITTEE ON ELEVATORS AND ESCALATORS

New Construction

I. Escalators and Moving Walks

A. Design

1. Connections which join the escalator or moving walk to the building shall be designed for seismic loads, in both principal horizontal directions, of 0.5g(D.L. + 0.4L.L.). The live load, L.L., shall be taken as 100 p.s.f.

2. Provide for the maximum design story drift in the design of connections.

a. Provide seismic restraint in the longitudinal direction at one end. The design shall account for torsion. All other supports must be free to slide in the longitudinal direction.

b. At the sliding end, the width of the beam seat shall be capable of accomodating, without damage, at least two times the current code allowable story drift in both tensile and compressive modes.

c. Provide seismic restraint in the transverse direction at all supports. The gap between the escalator truss and the seismic restraint shall not exceed 1/4 inch each side.

d. All shims used to support escalators and moving walks shall be designed by a Civil or Structural Engineer or Architect qualified

under the California Business and Professions Code. These shims shall meet the design criteria contained herein.

3. The handrail supports shall be designed to resist a lateral load of 50 pounds per foot applied at the top of the handrail. In balustrades which contain glass, the glass shall not be part of the structural support system of the handrail.

B. Quality Assurance

1. Plan Check

a. Require structural plan check of seismic connections, seismic restraints and handrail supports of all escalators and moving walks.

b. Require that the seismic connections, seismic restraints and handrail supports for all escalators and moving walks be designed by a Civil or Structural Engineer or Architect qualified under the California Business and Professions Code.

2. Inspection

a. In addition to the inspection by the City Building Inspector, require structural observation by the engineer or architect of record, or inspection by a licensed deputy structural steel and welding inspector, of all connections which join the escalator or

moving walk to the building.

II. Elevators

A. Design

1. Require that the rails be designed for the same seismic load as the rail brackets. The seismic load shall be applied at the most adverse position. The allowable stress shall be as specified by the AISC. Allowable deflection shall be as shown in the following table.

RAIL SIZE #/FOOT	ALLOWABLE DEFLECTION INCH
8	0.2
11	0.3
12	0.4
15	0.5
18.5	0.5
22.5	0.5
30	0.5

2. All rail joints shall be within 2 feet of their supporting bracket.

3. Require that counterweight and car frames be designed for a seismic load of 0.5g in the 2 principal horizontal directions.

The maximum seismic deflection of the frame components shall not exceed 0.5 inch.

B. Quality Assurance

1. Plan Check

a. Require structural plan check of the seismic design of guide rails, rail brackets, car and counterweight retainer plates, counterweights and equipment anchorage for all elevators.

b. Require that the seismic aspects of all elevators be designed by a Civil or Structural Engineer or Architect qualified under the California Business and Professions Code.

2. Inspection

a. In addition to the inspection by the City Building Inspector, require structural observation by the engineer or architect of record or inspection by a licensed deputy structural steel and welding inspector, of guide rails, rail brackets, car and counterweight retainer plates, counterweights and equipment anchorage for all elevators.

PRELIMINARY RECOMMENDATIONS
CITY OF LOS ANGELES NON-STRUCTURAL ELEMENTS
SUBCOMMITTEE ON ELEVATORS AND ESCALATORS
Existing Installations

I. Escalators and Moving Walks

A. Required Initial Inspection and Report

1. Establish a timetable and require an inspection of the connections which join the escalator or moving walk to the building. A report shall be prepared which verifies compliance with the design requirements contained herein. This inspection and report shall be prepared by a Civil or Structural Engineer or Architect qualified under the California Business and Professions Code.

If compliance cannot be demonstrated, the Engineer or Architect shall describe how the connections will be modified to comply.

2. Escalators and Moving walks shall be exempt from required retrofit if it can be demonstrated that escalator or walk cannot fall more than 30 inches.

B. Required Retrofit

1. Establish a timetable and require seismic design and retrofit of escalator and moving walk connections which do not comply with

the design requirements contained herein. It is recommended that the maximum time for compliance be 3 years after notification.

2.Require seismic design and retrofit of escalator and moving walk connections upon major alteration or the acquisition of a building permit for work valued at more than 10% of the value of the building for other purposes in the same building.

C. Design

1. Connections which join the escalator or moving walk to the building shall be designed for seismic loads, in both principal horizontal directions, of 0.5g(D.L. + 0.4L.L.). The live load, L.L., shall be taken as 100 p.s.f.

2. Provide for the maximum design story drift in the design of connections.

a. Provide seismic restraint in the longitudinal direction at one end. The design shall account for torsion. All other supports must be free to slide in the longitudinal direction.

b. At the sliding end, the width of the beam seat shall be capable of accepting, without damage, at least two times the current code allowable story drift in the tensile mode only.

c. Provide seismic restraint in the transverse direction at all supports. The gap between the escalator truss and the seismic restraint shall not exceed 1/4 inch.

d. All shims used to support escalators and moving walks shall be designed by a Civil or Structural Engineer or Architect qualified under the California Business and Professions Code. These shims shall meet the design criteria contained herein.

D. Quality Assurance

1. Plan Check

a. Require structural plan check of seismic connections and seismic restraints of all escalators and moving walks which require retrofitting.

b.Require that the seismic connections and seismic restraints for all escalators and moving walks which are to be retrofitted be designed by a Civil or Structural Engineer or Architect qualified under the California Business and Professions Code.

2. Inspection

a. In addition to the inspection by the City Building Inspector, require structural observation by the engineer or architect of record, or inspection by a licensed deputy structural steel and welding inspector, of all connections which join the escalator or moving walk to the building.

II. Elevators

A. Required Inspection and Report

1. Establish a timetable and require an inspection of counterweights, equipment anchorage and car rail retainer plates. A report shall be prepared which verifies compliance with the design requirements contained herein. This inspection and report shall be prepared by a Civil or Structural Engineer or Architect qualified under the California Business and Professions Code.

If compliance cannot be demonstrated, the Engineer or Architect shall describe how the installation will be modified to comply.

B. Required Retrofit

1. Establish a timetable and require seismic design and retrofit of counterweights, equipment anchorage and car rail retainer plates. It is recommended that the time for compliance be 3 years after notification.

2. Require seismic design and/or retrofit of counterweights, equipment anchorage, car rail retainer plates, car and counterweight rails, counterweight derailment devise and displacement switch and rail brackets upon major alteration (as defined by the City of Los Angeles Elevator Code), including change of control or operation, or the acquisition of a building permit for work valued at more than 10% of the value of the building for other purposes in the same building.

3. The car shall be weighed upon any major alteration and upon a new acceptance test. A new cross head data tag shall be provided each time the car is required to be weighed. The old data tags shall not be removed.

C. Design

1. Require that the rails be designed for the same seismic load as the rail brackets. The seismic load shall be applied at the most adverse position. The allowable stress shall be as specified by the Los Angeles Building Code. Allowable deflection shall be as shown in the following table.

RAIL SIZE #/FOOT	ALLOWABLE DEFLECTION INCH
8	0.2
11	0.3
12	0.4
15	0.5
18.5	0.5
22.5	0.5
30	0.5

2. All rail joints shall be within 2 feet of their supporting bracket.

3. Require that counterweight and car frames be designed for a seismic load of 0.5g in the 2 principal horizontal directions.

The maximum seismic deflection of the frame components shall not exceed 0.5 inch.

D. Quality Assurance

1. Plan Check

a. Require structural plan check of the seismic design of guide rails, rail brackets, car and counterweight retainer plates, counterweights and equipment anchorage for all elevators which are to be retrofitted.

b. Require that the seismic aspects of all elevators, which are to be retrofitted, be designed by a Civil or Structural Engineer or Architect qualified under the California Business and Professions Code.

2. Inspection

a. In addition to the inspection by the City Building Inspector, require structural observation by the engineer or architect of record or inspection by a licensed deputy structural steel and welding inspector, of guide rails, rail brackets, car and counterweight retainer plates, counterweights and equipment anchorage for all elevators which are to be retrofitted.

TR 95-70

Letter Ballot Results		App	Not App	Abst	Not Vot	Not Ret
Opened: 29 Jan 96	Main Committee	22	4	0	0	4
Closed: 11 Mar 96	NIRC		2			
	Additional Comments: 1					

TR 95-70 (Escalator and Moving Walk)

Revise Rule 905.1r as follows:

> **905.1r Comb-Pallet Impact Devices.** Devices shall be provided which will cause the opening of the power circuit to the moving walk driving machine motor and brake if either:
> (1) a horizontal force not greater than 400 lbf (1780 N) in the direction of travel is applied ~~exceeding 112 lbf (500 N)~~ at either side, or not greater than ~~exceeding 225 lbf (1000 N)~~ 800 lbf (3560 N) at the center of the front edge of the combplate; or

Reason: Experience backed up by test data indicate that the present level of forces required are too low and create false stops. Further test data show that the new figures would prevent casual contact with the comb from tripping the comb-pallet impact device. This TR is similar to TR 95-14 for the combplate impact device on escalators.

Responses to Letter Ballot Comments

Not Approved Votes **Responses**

Jim Filippone:

(1) The test data provided to justify these TR's is grossly insufficient for the magnitude of the proposed changed.

In fact, during the ballot process (TR95-14) information from several sources indicated that the present Code requirements have prevented serious injuries to the public and do not present a danger of false stops.

The force limits are so high that the step(s), pallet(s), and combplate(s) could be seriously damaged, since they are not required by Code to meet these higher forces, before this device could activate.

THEREFORE, THESE CHANGES ARE UNJUSTIFIED, POTENTIALLY DANGEROUS, COUNTER TO ACTUAL EXPERIENCE AND WOULD DECREASE PUBLIC SAFETY.

(2) It appears that the Code is being changed so that certain existing designs will not have to be modified. The A17 Code must endeavor to protect public safety as its first priority.

THEREFORE, IF CERTAIN DESIGNS EXIST THAT CAN'T MEET PRESENT CODE

REQUIREMENTS, THEN THOSE DESIGNS SHOULD BE CHANGED, NOT THE CODE. THE LIABILITY TO THE ASME'S ASSETS WOULD BE SUBSTANTIAL IF THE CODE WAS CHANGED IN THIS MANNER.

(3) These TR's are in violation of the Harmonization process with CSA B44.

THEREFORE, THESE CHANGES ARE OUT OF ORDER.

(4) The only justified change in the proposals is to change the word "exceeding" to "not greater than". This should be done throughout Rules 805.1u and 905.1.

(5) The way the TR's are written, it is unclear what is being done with the vertical force requirements. Are they being deleted or remaining the same?

A. Verschell:

Repeat all comments for TR 95-14

L. White:

The comments I previously made, regarding escalators still apply.
The rule change does not enhance safety and may decrease safety.

C.E. Vlahovic:

1. Increased force means lowering safety on moving walks and increasing safety risk, which I cannot approve.

2. False stops are inconvenient but not unsafe, at least from the A17.1, Section 905 view-point, because that section lists 15 other devices the operation or malfunction of which could cause a false stop.

3. Before considering approval of the proposed revision, I would need detailed analysis of accidents caused by "false stops" initiated by the "present level of forces" versus accidents alleviated by the impact device set in accordance with the currently revised forces.

4. I have not withdrawn my "not approved" vote on a similar TR95-14 applicable to escalators.

H.H. Hayes (NIRC):

Combplate Impact Device

By increasing the horizontal force, a hazard is created to the riding public. Therefore, I feel that