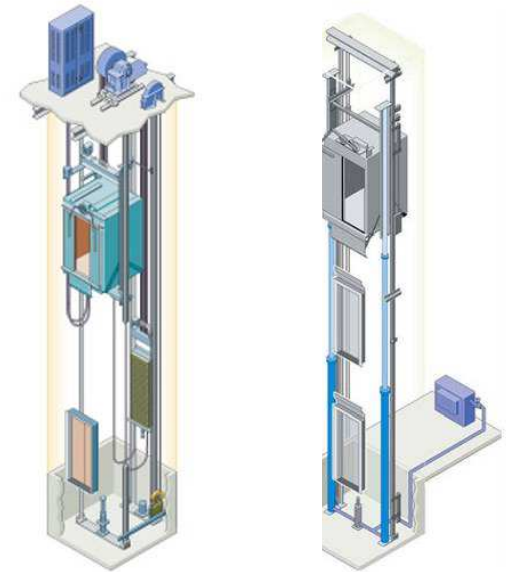


Comment Stage for EN81-20

EN81-20 and EN81-50

EN 81-20

- Passenger and goods passenger lifts
 - Contains requirements for complete passenger or goods passenger lift installations independent of the driving system
 - Groups all the technical requirements for design of
 - Electric drive systems (currently EN81-1)
 - Hydraulic drive systems (currently EN81-2)
 - All other drive systems



EN 81-50

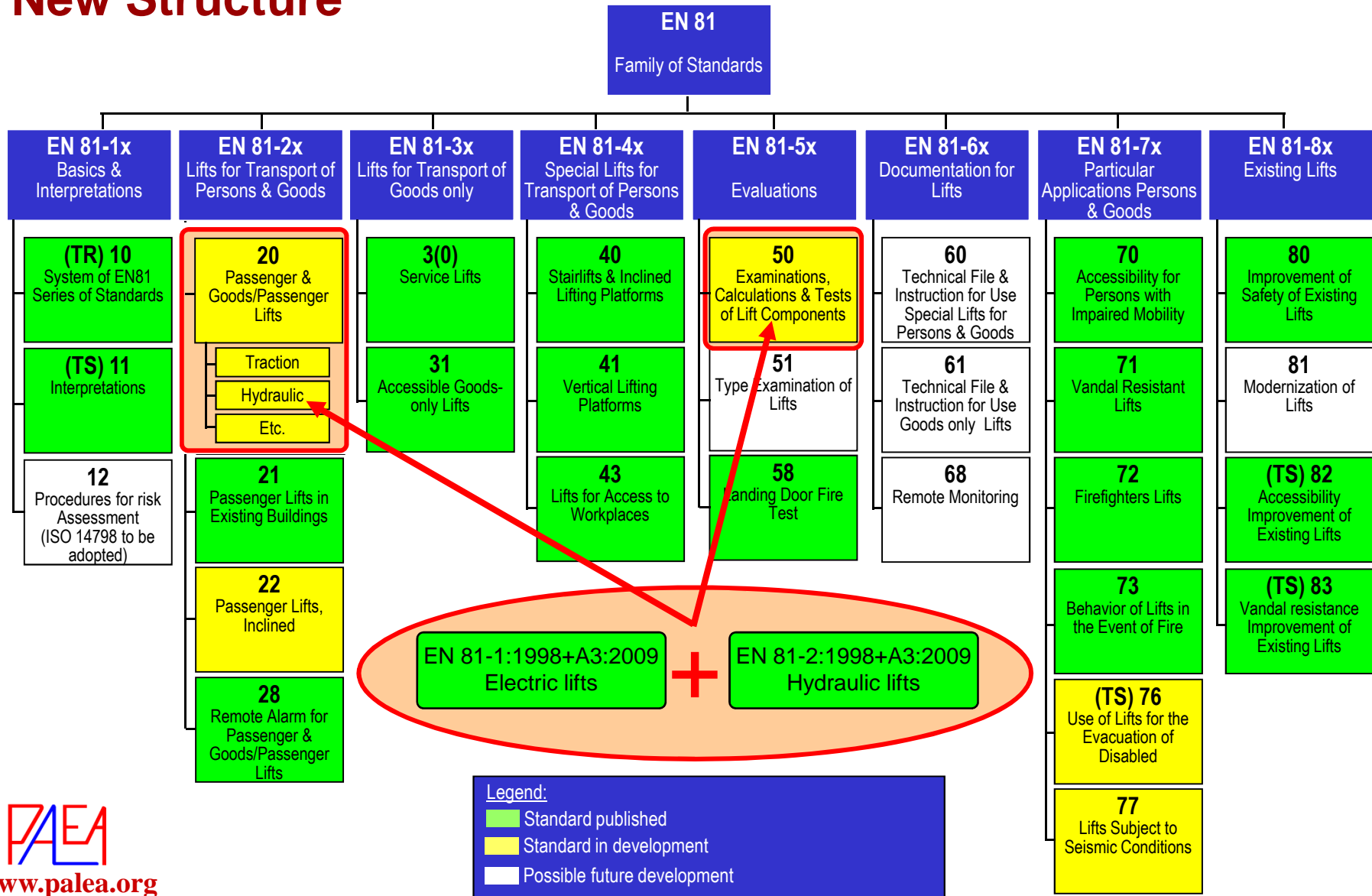
- Examinations, calculations & tests of lift components
 - Contains description of the examinations, calculations and tests of lift components used in any type of lift (passenger, goods passenger, goods only lift, etc.)





Asia Pacific Input to EN81-20

New Structure



Asia Pacific Input to EN81-20

Background

Evolution of the “state of the art” for safety

- The current standard is more than 13 years old and needed to be aligned with current safety requirements
- Needed to incorporate the result of studies of the Lift Industry on safety aspects, such as strength of the doors and requirements for safety spaces
- Needed to align with the requirements of the Asia Pacific Region



Asia Pacific Input to EN81-20

Input to revision

- More than 80 CEN Interpretations on current edition
- Three amendments since 1998, A1 (PESSRAL), A2 (MRL) and A3 (UCM)
- Input from European interest groups, such as Trade Associations and the EU Commission
- Contribution and requests from non-European interest groups from PALEA, Asia Pacific and North America, etc.
- ISO/TC 178 work on harmonization of International standards
- New technologies and current state of the art



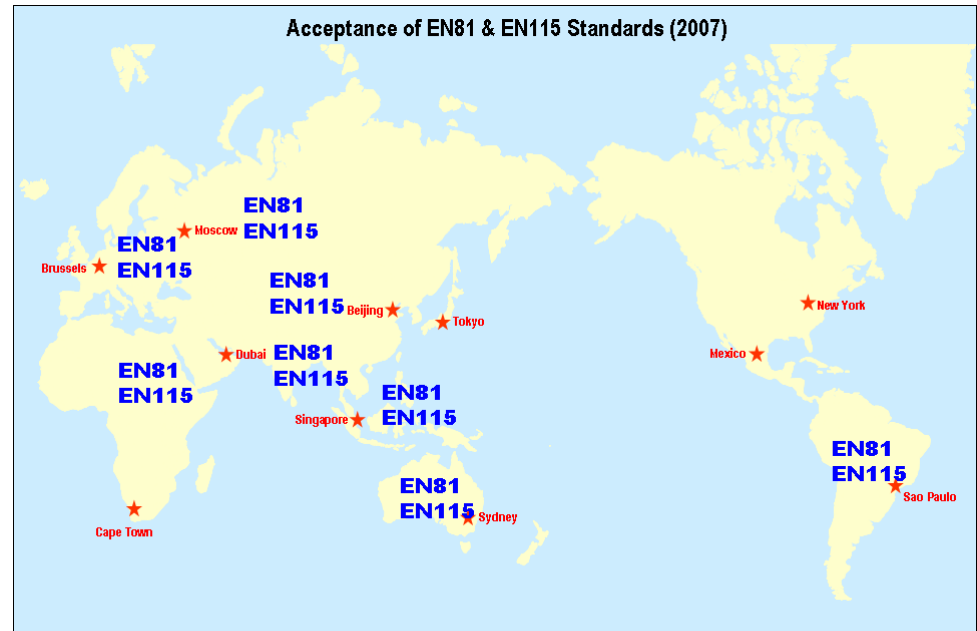
Revision outcome

- Clauses had to be renumbered – (Car doors and landing doors are now in the same section)
- Traction lifts and hydraulic lifts are now in the same document
- Clauses are supported by “formal” Risk Assessment
- Format is harmonised with current CEN & ISO standards
- Clauses are consolidated and redundancies are removed
- Overall user friendliness should be improved

Asia Pacific Input to EN81-20

International use

- EN 81-1 and EN 81-2 have wide acceptance around the world
- Accepted by many countries with or without national deviations
- Unique opportunity for harmonisation of regional codes and standards, resulting in
 - Promoting and harmonizing the level of safety
 - Establishing common technical understanding for the entire profession
 - Improving the efficiency of the industry with benefits for all stakeholders
- To maintain such harmonization, close cooperation of National and International standardization organizations is essential



Asia Pacific Input to EN81-20

International Cooperation Group

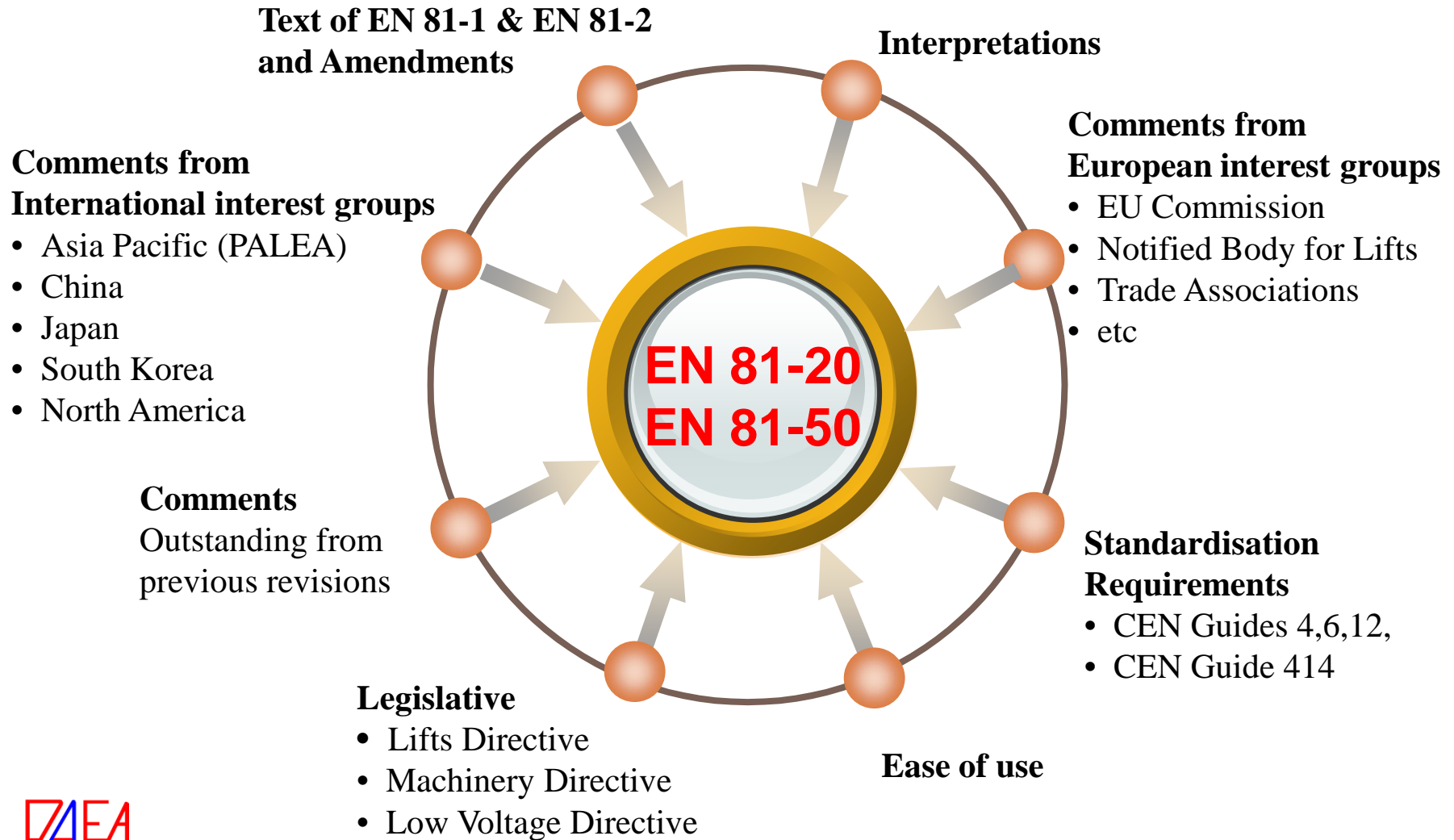
- CEN/TC 10 Plenary in 2007, decided to extend the cooperation with the users of the EN standards outside Europe
- By applying ISO and CEN Cooperation agreement, and through ISO and CEN resolutions, ISO members were appointed to participate in the revision of standards
 - Asia Pacific
 - PALEA for the Asia Pacific area
 - China
 - Standardization Administration of the People's Republic of China (SAC/TC196)
 - Korea
 - Korean Elevator Safety Institute (KESI)
 - Japan
 - Japan Elevator Association (JEA)
 - United States of America
 - American National Standards Institute (ANSI)





Asia Pacific Input to EN81-20

Main inputs

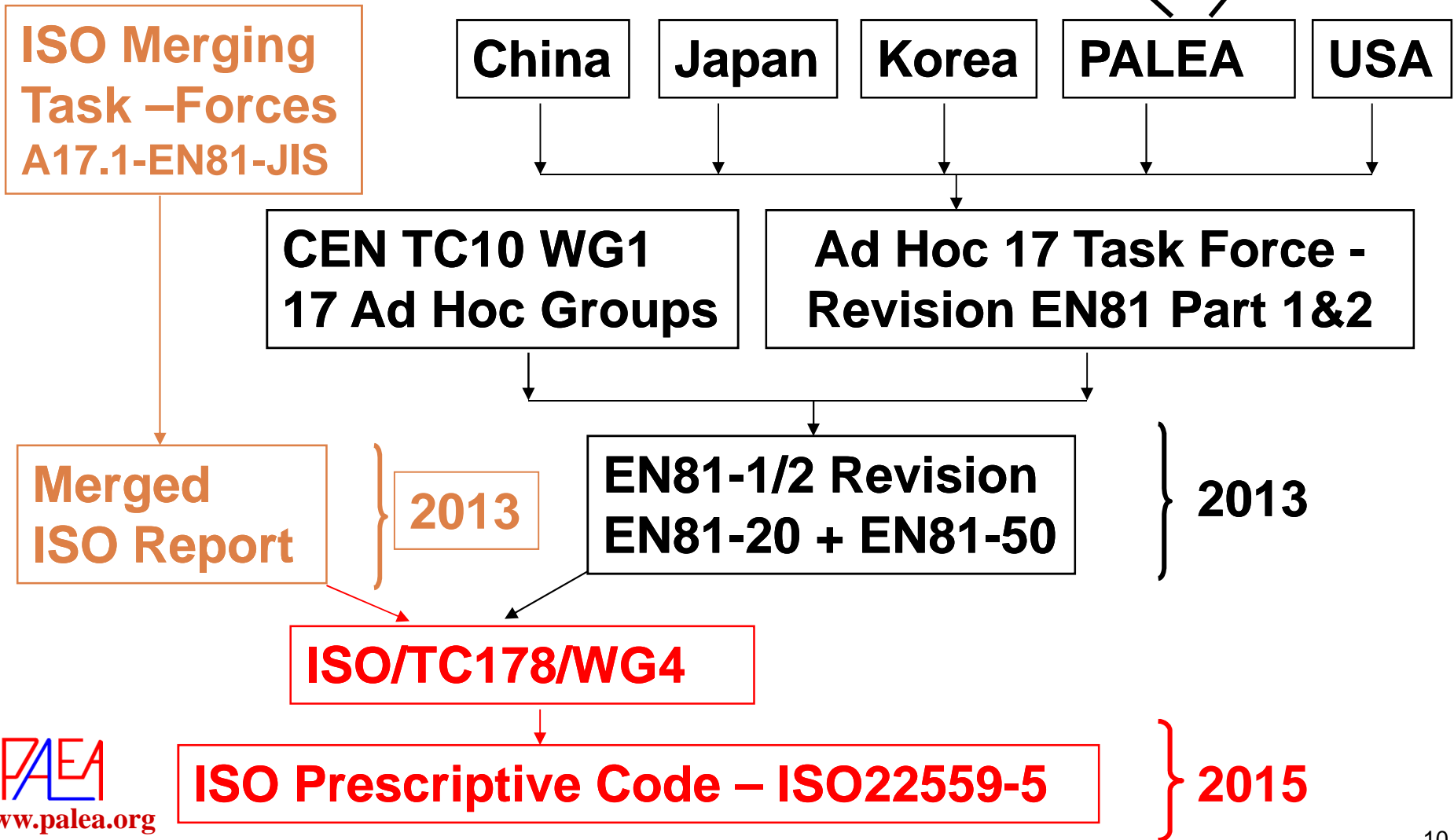




Asia Pacific Input to EN81-20

India, Malaysia, Singapore, Taiwan, Hong Kong, Vietnam, New Zealand, Australia, Vietnam, Thailand, Indonesia

Global input to EN81-20/50



Asia Pacific Input Schedule

- Comment stage launched in November 2011
- End of comment stage is end of April 2012
- Every comment received by WG1 will be considered and feedback will be provided
- During April 2012 PALEA will collect and collate all of the Asia Pacific comment and complete the official CEN comment documents
- PALEA will send the CEN comment documents to the CEN TC10 WG1 Secretary by the end of April 2012
- In May of 2012 PALEA will provide feedback via, the PALEA members, to everyone who attended the PALEA EN81-20 workshops

Assumptions, Scope and Definitions

→ Assumptions and Scope

- Average weight of person 75kg #0.2.5
- The standard is not retrospective from date of issue # 1.4

→ New definitions

- Authorised person #3.2
- Brake set #3.5
- Competent person #3.8
- Maintenance #3.29
- Rescue operation #3,45
- Safety circuit #3.48
- Special tool #3.55



Goods Passenger Lifts

- Negotiations have to be made between the customer and the supplier about:
 - The intended use of the lift;
 - **New** - Type and mass of the handling devices intended to be used in the case of goods passenger lifts; #0.3.1 b)
- **New** - The requirements of 5.4.2.1 shall be applied and, in addition, design calculations shall take into account not only the rated load but also the weight of handling devices, which may enter the car. #5.4.2.2.1



Factors of Safety

→ Generally FOS are not used in EN81 #0.3.2

→ What is stated in the assumptions is:

Possible risks have been considered for each component that may be incorporated in a complete lift installation and rules have been drawn up accordingly

Components are:

- Designed in accordance with usual engineering practice and calculation codes, taking into account all failure modes;
- Of sound mechanical and electrical construction;
- Made of materials with adequate strength and of suitable quality;
- Free of defects.



Accessible Spaces below the pit

→ Accessible spaces below pit #5.2.5.4

- The counterweight or the balancing weight shall be equipped with safety gear; or
- **New** - There shall be installed below the counterweight buffer or under the travelling area of the counterweight, a pier extending down to the foundation of the building.
- **New** - The maximum kinetic energy from the free falling counterweight to the pit shall be communicated to the building designers.



Lift well counterweight screens

→ Counterweight screens #5.2.5.5.1

- **New** definition - to allow passage of compensation chain etc.
- **New** strength parameter - Withstand 300 N without deflecting into the path of the counterweight
- **New** – Screen is shorter and narrower than existing standard



Lift well shaft division screens

- **New** - The requirement for full height shaft division screens has now been changed from “500 mm from the side of the car to the nearest moving part”, to “500mm from the handrail to the nearest moving part” [#5.2.5.5.2.2](#)



Lift well pit inspection control station

- **New** - mandatory requirement for a lift well pit inspection control station. #5.2.1.5.1
 - **New** - In the event of persons on the car roof and in the pit the car shall only move when the same buttons are pressed on both units #5.12.1.5.2.1 j)



Pit egress device

- **New** - If lowest landing door lock is not within 1m of the pit access ladder a means must be provided to unlock the doors from the pit – (Lift well pit egress device)
#5.3.9.3.5



Lift well pit access

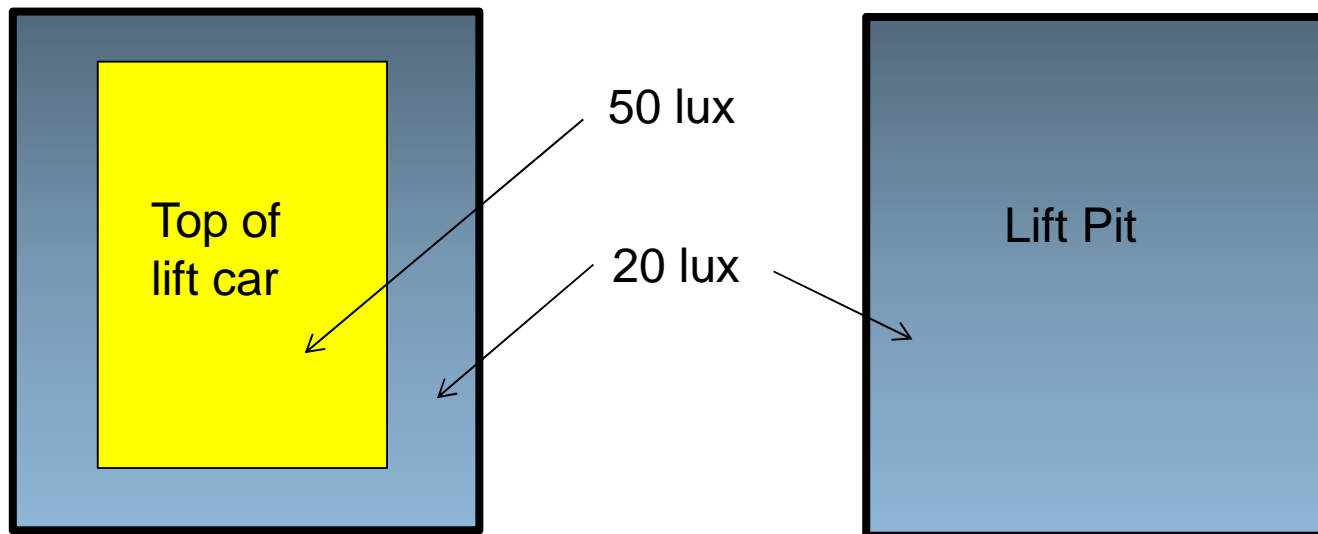
Lift well pit access and pit ladders #5.2.2.3 and Annex F

- **New** requirements for pit access ladders and to provide them with a safety contact where necessary
- **New** normative annex gives the possible ladder types



Lift well Lighting

- The requirements for the lighting of the lift well have been relaxed [#5.2.1.4](#)
 - At least 50 lux 1.0 m above the car roof: **New** - within the projection of the car
 - At least 50 lux 1.0 m above the pit floor: **New** - where a person can stand and move between work locations
 - **New** - At least 20 lux in any other location in the lift well or pit





Asia Pacific Input to EN81-20

Safety spaces on top of car when counterweight is landed -1

→ Safety spaces /volumes and clearances on top of the car # 5.2.5.7.1

- **New** - There must be standing areas (clear area and safety volume) for the number of persons anticipated to work on the car
- **New** - Any part of the car roof having a clear area of 0,12 m² and a minimum dimension of 250mm on one side is to be considered as a place where a person might stand and requires a minimum clearance as per Table 2
- **New** - Clear signage stating how many persons are permitted to work on the car
- **New** - Each person must have their own safety volume available
- **New** - Clearance over fixed equipment increased from 300mm to 500mm plus “jump” with exception of the handrail
- **New** - Handrails to have 400mm horizontal clearance to items outside the projected area of the car



Safety spaces on top of car when counterweight is landed -2

A = 500 mm + jump

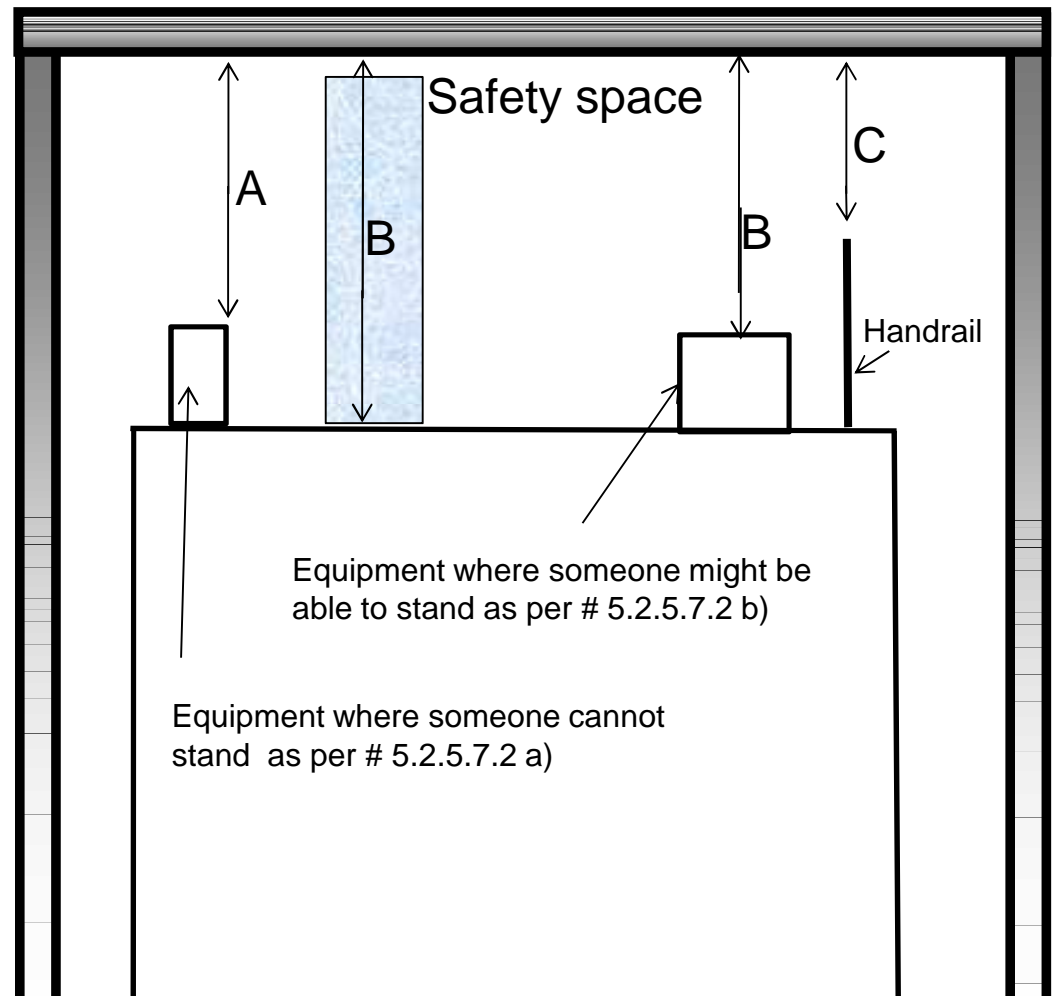
B = 2 m + Jump when standing

B = 1m + jump when crouching

C = 300 mm + jump

New - Safety space /volume includes both standing or crouching posture and are slightly larger than before
[#5.2.5.7.1 Table 2](#)

New – Safety volume must be clearly marked on the car roof
[#5.2.5.7.1](#)

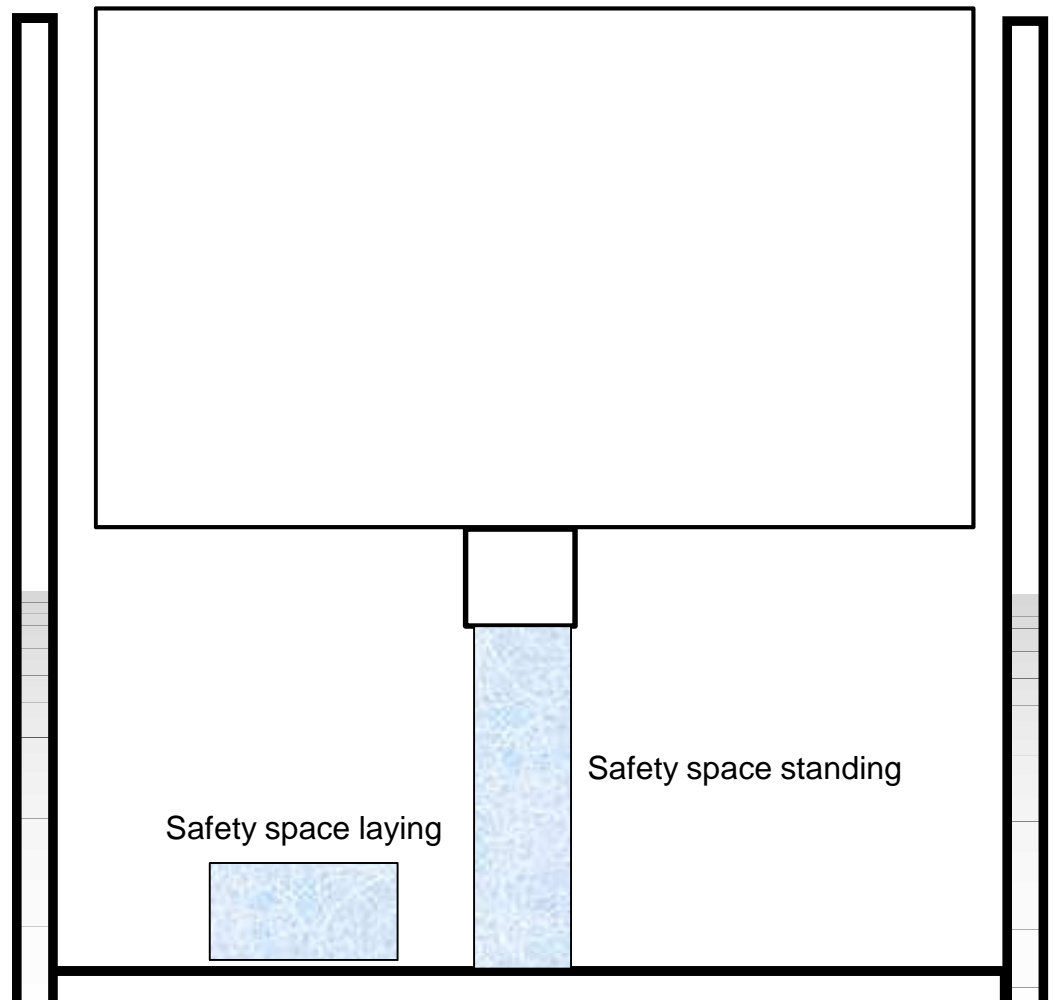


Lift pit safety spaces (Safety Volume)

→ **New** - There must be standing areas for the number of persons anticipated to work in the pit # 5.2.5.8

New - Safety volume includes both standing or laying posture and are slightly larger than before #5.2.5.8.1 Table 3

New – Bottom of safety volume must be clearly marked on the pit floor #5.2.5.8.1



Machinery spaces - Floor

- **New** - Updated rules with regard to differences in floor levels in machine room floors resulting in the need for additional ladders and barriers [#5.2.6.3.2.4](#)
- **New** - Updated rules with regard to gaps in floors [#5.2.5.3.2.5](#) Page 39
Note that the clause number in the comment document is an editorial error – should be [#5.2.6.3.2.5](#)



Machinery spaces - Lighting

- **New** - Modified rules for lighting levels in machinery spaces [#5.2.1.4.2](#)
 - 200 lux where work is carried out and also for movement between work areas



Sheaves in lift well

→ New rules for pulleys used in the well #5.5.8

- Retaining devices required
- Ability to access pulleys safely
- Headroom clearance considerations at top of well



Working areas on car roof

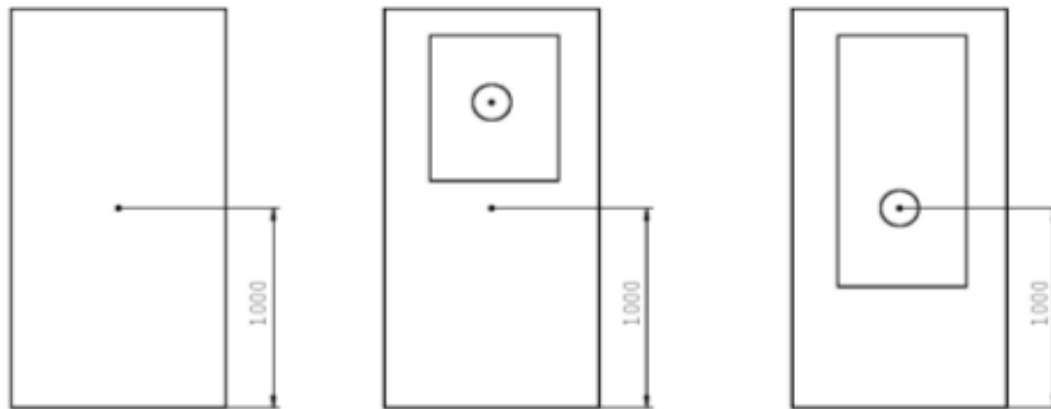
- When working on car roof and the car is prevented from moving by a mechanical device #5.2.6.4.3.1
 - When this device is in its active position and cannot be disengaged safely due to forces exerted by the car, it shall be possible to leave the car roof:
 - **New** - directly via the landing door by a clear opening of at least 0,50 m x 0,70 m above the car door header / door drive, or
 - **New** - via the car by access through a trap door in the car roof having a clear opening of at least 0,40 m x 0,50 m. Steps, ladder and/or hand hold(s) shall be provided to allow a safe descent into the car, or
 - **New** - Exit the well via an emergency door as 5.2.3.



Landing and car entrances – Soft pendulum test

Landing and car entrances – Mechanical strength # 5.3.5.2

- **New** strength parameters for landing doors and frames and also car doors
- **New** - All landing doors and frames and car doors now subject to soft pendulum impact testing at their weakest points
 - The details of the tests are to be found in EN81-50 [Clause #5.14](#)



Landing and car entrances: strength and forces # 5.3.5.2

- **New** -300 N, on area 5 cm², at any place, both sides
 - Limited elastic deformation and no permanent damage
- **New** requirement of 1000 N, on area 100 cm², at any place, landing side
 - No permanent deformation
 - Door operation remains possible after test
- **New** requirement for 1000 N and 300 N forces to act simultaneously for design and test purposes
- **New** - Retaining devices are to be provided should the main guiding elements fail, and these also have to be impact tested



Landing and car entrances: strength and forces cont'd # 5.3.5.2

- **New** - Soft bag pendulum test, landing side, 800 mm fall
 - No loss of integrity
 - No need to operate after test
- **New** - More accurate description of the test method to ensure repeatability of the test
- **New** - More accurate description of the test method to ensure repeatability of the test



Panels made of glass

- Panels made of glass #5.2.1.8.3
- Glass panels, plane or formed shall be made of laminated glass.
 - **New** - They shall withstand 1000 N horizontal static force on an area of 0,30 m x 0,30 m at any point without permanent deformation



Special requirements for glass doors

- Special requirements for glass doors to protect children's fingers #5.3.5.2.8
- Making the glass opaque on the side exposed to the user by the use of either frosted glass or the application of frosted material to a height of minimum 1,10 m, or
 - Sensing the presence of fingers at least up to 1,6 m above sill and stopping the door movement in opening direction, or
 - **New** - Limiting the gap between door panels and frame to maximum 4 mm at least up to 1,6 m above sill.



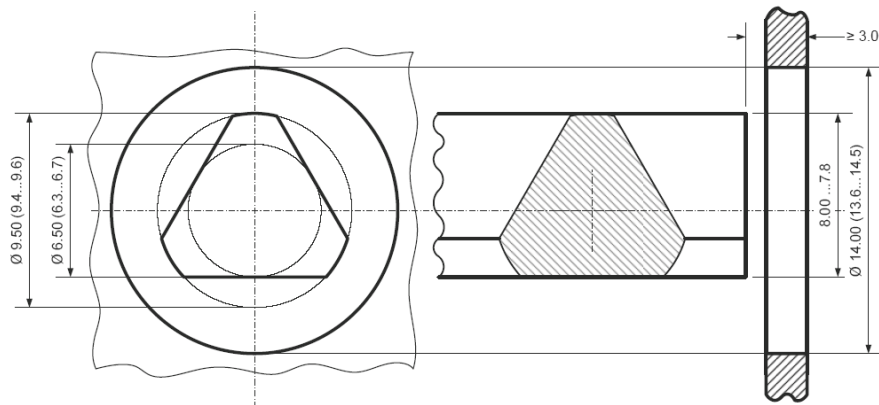
More than 11m between landing doors

- When distance exceed 11m between consecutive landing doors #5.2.3.3
 - Fit an emergency access door; or
 - **New** – provide Emergency Electrical Operation according to #5.12.1.6



Landing door access device

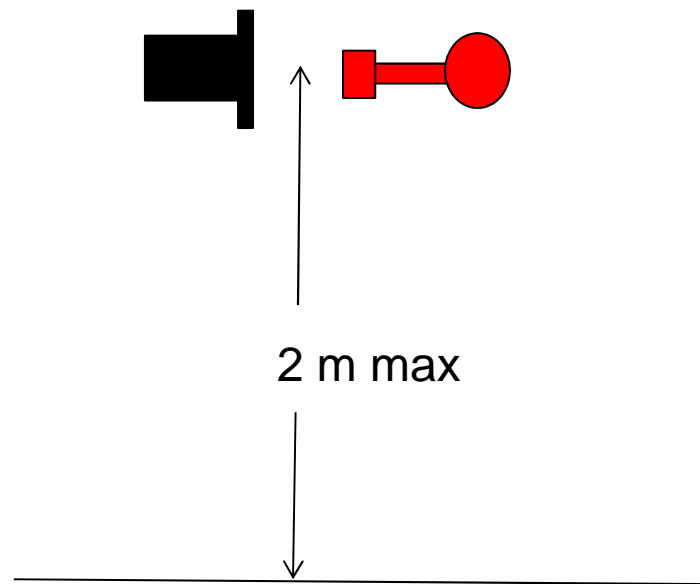
- **New** tolerances for unlocking access device to prevent use of commonly available keys #5.3.9.3 (Fig 10)



Landing door access device location

Landing door access device location #5.3.9.3.2

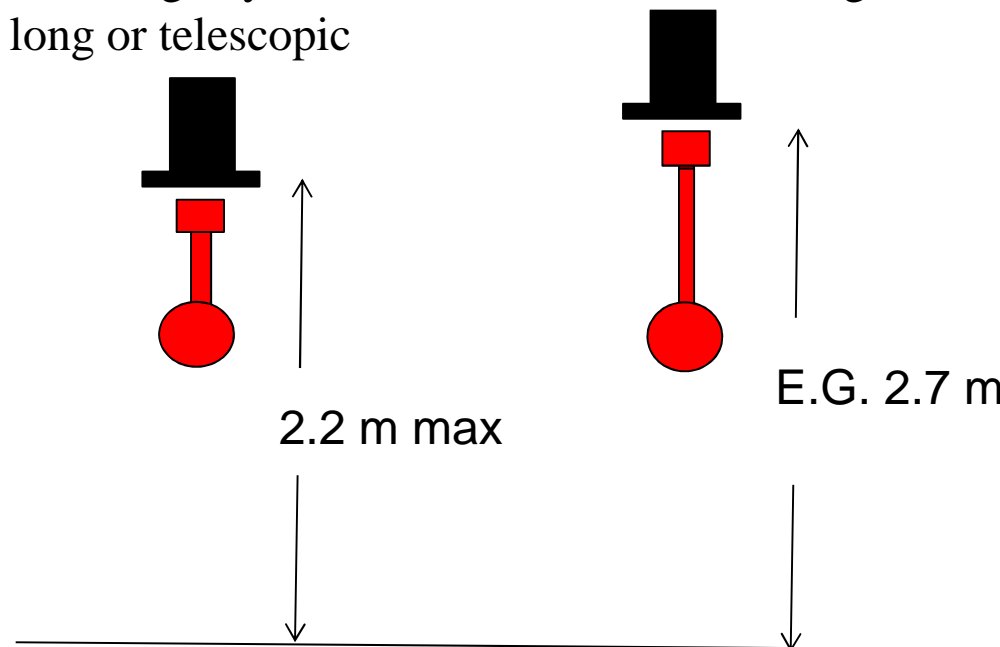
- **New** -When fitted on door panel or door frame - maximum height above landing sill of 2 m



Landing door access device location cont....

Landing door access device location #5.3.9.3.2

- **New** - When fitted on door frame with the access device facing down – maximum height of 2.2 m unless a long key is used E.G. With a 2.7 m high door the key would need to be 500 mm long or telescopic



Car door strength

- **New** - Exceptions for car entrances #5.3.5.2.1 b)
 - 1000 N, on area 100 cm², at any place, only on car side
 - No pendulum test (except for glass doors) #5.3.5.2.2



Car door locking

- **New** - Car door cannot be opened more than 100mm under manual effort when outside the unlocking zone #5.3.15.4



Car door locking cont....

- Car door locking is required if the horizontal distance between the car sill and the inner surface of the lift well exceeds 150 mm. #5.2.5.3.2 c) and #5.3.15.5



Force to hold car door closed

- **New** - Car door must be held closed with a force of at least 50N when the car is moving, regardless of the rated speed of the lift [#5.3.15.1](#)



Landing and car door protection device

- If kinetic energy of door closing exceeds 4 J: #5.3.6.2.1.1
- Protective device to reopen the door and so prevent door impacting obstacles
 - Active from 50 mm to 1600 mm high
 - Active until 20 mm from door closed
 - In case of failure (or de-activation), door energy to be reduced to 4 J
 - **New** – when “nudging” acoustic signal always required



Lift car emergency lighting

→ Lighting in car

- **New** - Emergency lighting: Parameter is now “Lux” instead of “Watt” [#5.4.10.4](#)



Lift Car wall strength

- Car wall strength
 - **New** parameters for strength of car walls # 5.4.3.2.2



Lift Car apron

- **New** requirements for the strength of the car apron / toe guard #5.4.5.3
 - 300 N at the “weakest point”
 - 35 mm max deflection without permanent deformation



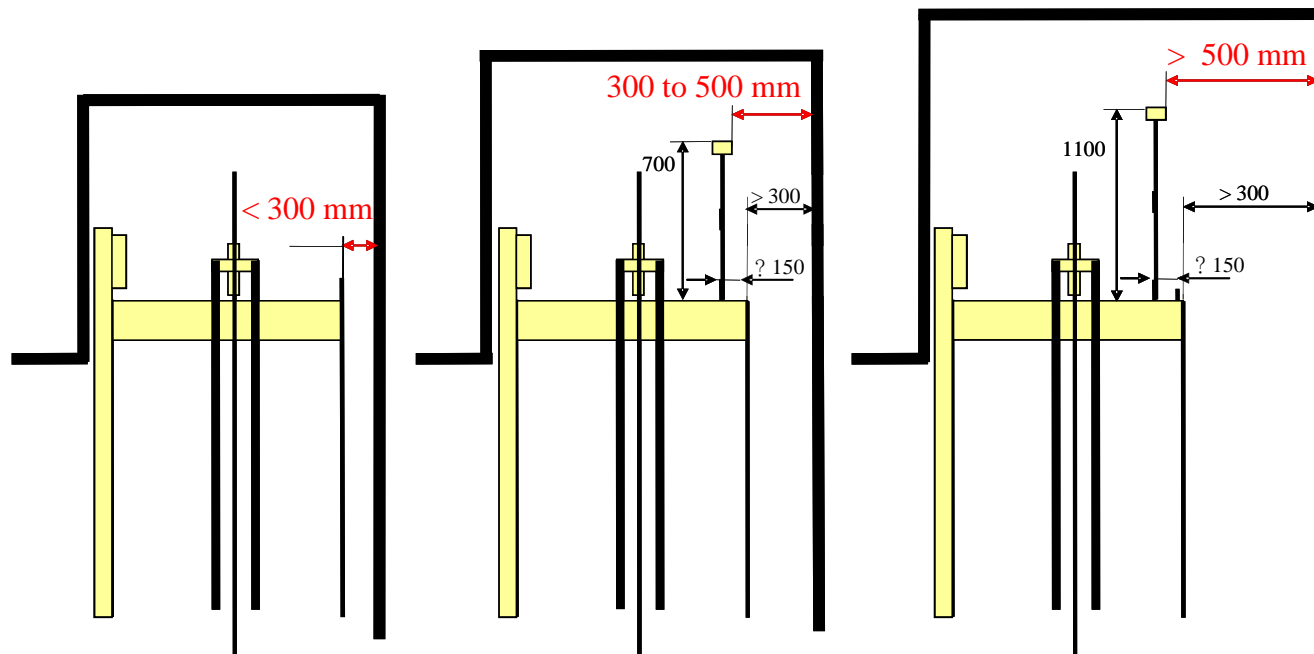
Lift Car Balustrade

- **New** requirements for the strength of the lift car roof balustrade [#5.4.7.2.2](#)
 - Withstand horizontal force of 300 N



Lift Car roof top balustrades cont....

- **New** - All lift cars regardless of well clearances to have a “toe board” around the car roof edge #5.4.7.2.1 a) and #5.4.7.3 b)



Toe board only required

700 mm high balustrade

1100 mm high balustrade



Lift Car: Available car area, rated load

- Load will continue to be calculated at 75kg per person #0.2.5
- **New** - Car area to be calculated as from wall to wall body inner dimensions. Finishes are excluded #5.4.2.1
- **New** - Areas which cannot accommodate a person due to their size need not be included in the floor area calculation #5.4.2.1.1
- **New** - Door entrance recesses of less than 100mm depth need not be included in the floor area calculation #5.4.2.1.1
- **New** - A new sample calculation, including loading devices is given #5.4.2.2.1



Rope Traction

- **New** - Improvement and completion of traction formulas and these will be stated in EN 81-50
- Rope traction #5.5.3
 - Either the ropes or traction media shall slip if car or counterweight is blocked: or
 - **New** - The drive system is to limit motor torque.



Slack rope switch

- **New** - Where there is relative extension of one rope to all others the lift is to stop at next floor – (slack rope switches required) [#5.5.5.3](#)



Rope compensation

- Use of compensation devices [#5.5.6.1](#)
 - **New** - Up to 3,0 m/s, compensation by belts, chains, ropes
 - Safety factor 5

- For speeds exceeding 3,0 m/s, compensation ropes with tensioning device to be provided [#5.5.6.2](#)

- For speed exceeding 3,5 m/s there shall be, in addition, an anti-rebound device [#5.5.6.3](#)



Suspension means

- Note that no new technologies such as belts or alternative forms of ropes have been incorporated at this time.
 - This is due to concerns over the inclusion of patented or copyright protected materials
 - It is however likely that future revisions would include such materials



Guide Rails

→ New requirements for guide rails and their installation #5.7



Buffers and their markings

→ **New** requirements for buffers and their installation #5.8



Lift machine brake release

- The machine shall be capable of having the brake released by a continuous manually operated system, even in the case of a power supply failure.
- **New** - The operation can be mechanical (e.g. lever) or electrical by independent (E.G. Battery) power supply. [#5.9.2.2.2.7](#)



Unintended Movement Protection

→ Unintended Movement Protection will be a mandatory requirement #5.6.7



Final Limits

- **New** - Electro-mechanical final limits always required unless substituted by SIL rated device #5.12.2.3



Roof top inspection control

- **New** - Inspection controls are to stop the lift with 2m clearance in the pit and top of lift well. Further movement towards the minimum refuge spaces is then allowed upon pressing the control button again but at a maximum speed of 0,3 m/s [#5.12.1.5.2.1](#)



Landing and car door by-pass

- **New** - Landing and Car Door By-pass Control [#5.12.1.8](#)
 - Stop the lift if a bridge is inadvertently left on a door lock or on the door lock circuit



Door circuit monitoring

→ **New** - Door circuit monitoring #5.12.1.9

- Monitors the closing and opening of both landing doors and the car doors.
E.G. If the car door opens and the landing door lock circuit does not open then the lift will be shut down



EMC requirements

- The electromagnetic compatibility shall comply with the requirements of EN 12015 and EN 12016. #5.10.1.1.3



Electronic components in Safety circuits

- Programmable electronic systems in safety related applications (PESSRAL) [#5.11.2.6](#)
 - Tables A.1 and A.2 give the safety integrity level for each electric safety device.



Emergency Alarm

- **New** - The emergency alarm is now specified to be the same as that of EN 81-28
#5.12.3



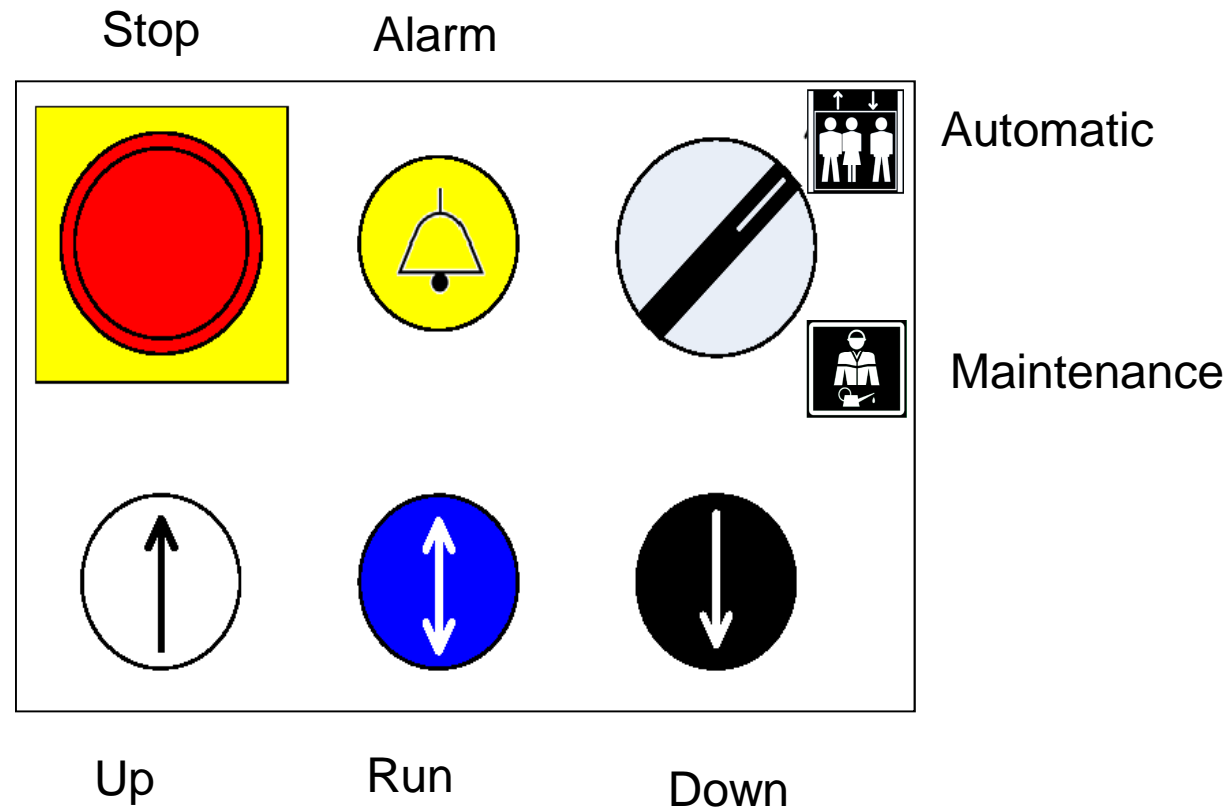
Control System enhancements

- **New** - The control system, to enable safe and easy maintenance, shall be provided with special means #5.12.1.7
- To prevent the lift from answering landing calls
 - To disable the automatic door operation
 - To be able to input at least terminal floor calls



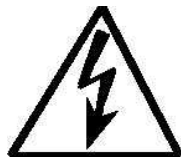
Maintenance / Inspection Controls and new Pictograms

- Inspection control buttons and switches #5.12.1.5.2.3
- **New** - Run or common button must be provided #5.12.1.5.1.2 c)
- Communication device /alarm button must be fitted on top of car and in pit #5.2.1.6



Electrical Installations

- **New** - All electrical equipment shall now be in accordance with EN 60204-1 unless otherwise described. #5.10.1.1.2
- **New** - Labeling now required for electrical and thermal hazards. #5.10.1.1.6 & # 5.10.1.2.1



- Socket outlets to be provided with Residual Current Device (RCD) at 30mA #5.10.1.2.3





**THANK YOU
FOR
YOUR
ATTENTION !**