Future RPE standards – changes and challenges

OH 2017

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Content

- RPE Selection
- Assigned Protection Factors
- New ISO RPE standards
  - New concept of ISO Protection Levels (Protection Class)
  - Overview of new ISO RPE standards
- Current actions and challenges ahead

RPE Selection

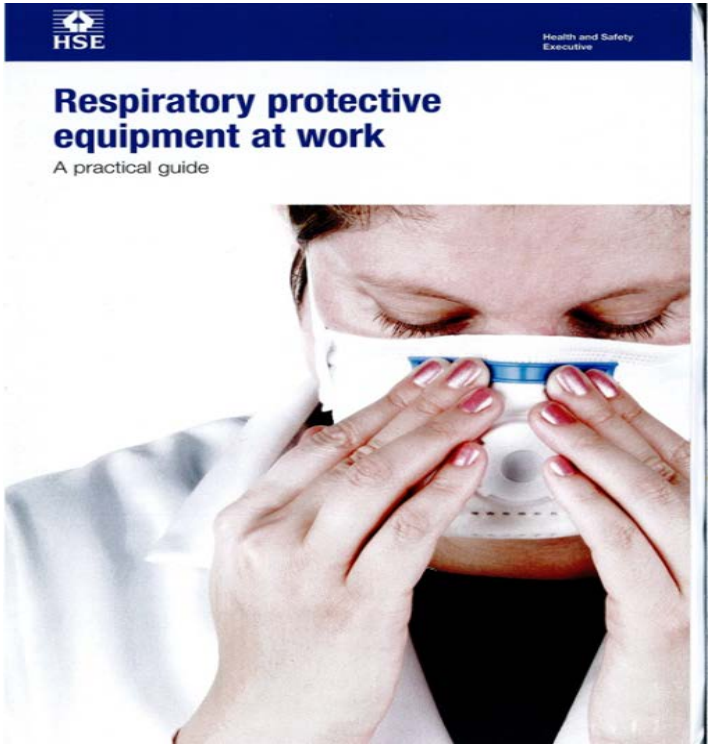
- RPE must be:
  - *Suitable* for environment, the task and the wearer
  - *Adequate* for the concentration of contaminant

Which RPE is adequate?

How do you know the protection provided?

HSE guidance HSG53

- *"To help you, each RPE type and class is categorised by an assigned protection factor (APF). The APF is a number rating that indicates how much protection that RPE is capable of providing."*



UK Protection Factors

Adequacy/suitability	Respirators						
RPE type							
	Disposable half mask – particle filter*	Reusable half mask – particle filter	Reusable half mask – gas/ vapour filter	Full face mask – particle filter	Full face mask – gas/vapour filter	Powered mask	Powered hoods/helmets
Effective for particles	✔	✔	✘	✔	✘	✔ **	✔ **
Effective for gas/vapour	✘	✘	✔	✘	✔	✔ **	✔ **
Continuous wear time	Less than 1 hr	Less than 1 hr	Less than 1 hr	Less than 1 hr	Less than 1 hr	More than 1 hr	More than 1 hr
APF4 types	✔	✔	✘	✔	✘	✘	✘
APF10 types	✔	✔	✔	✔	✘	✔	✔
APF20 types	✔	✔	✘	✘	✔	✔	✔
APF40 types	✘	✘	✘	✔	✘	✔	✔
APF200 types	✘	✘	✘	✘	✘	✘	✘
APF2000 types	✘	✘	✘	✘	✘	✘	✘
Page reference	29	30	31	32	33	34	35

CEN TIL, NPF & UK APFs

% TIL [filter pen]	CEN NPF	UK APFs				
		4	10	20	40	2000
0.05	2000				TM3	SCBA
0.05 [+ 0.05]	1000				FFM P3	
0.2	500				TH3	
0.5	200			TM2		
2	50		FAH HM	FFP3/TH2	x4	
5	20		TM1			
0.05 [+ 6]	16		FFM P2			
8	12		FFP2			
10	10		TH1			
0.05 [+ 20]	5	FFM P1	x5			
22	4	FFP1				

Derived from WPF studies

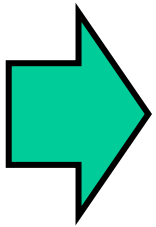
Sources: EN529; HSG53 Respiratory Protective Equipment at Work: A Practical Guide
Not all types/classes shown

New ISO RPE standards

- CEN baseline performance - focus on RPE design
- ISO baseline performance - focus on human factors
- Result move from individual products standards (>15) to 2 main performance standards
  - breathing apparatus
  - filtering devices

ISO – TIL performance concept

CEN % TIL
0.05
0.2
0.5
2
5
8
10
22



ISO % TIL
0.001
0.01
0.1
1
5
20

ISO Classification is not defined by the type of RPE

Except for some RPE for Special Applications, there are no specific *RPE type* class requirements

So '<u>any</u>' performance possible

CEN TIL, NPF & UK APFs

% TIL [filter pen]	CEN NPF	UK APFs				
		4	10	20	40	2000
0.05	2000				TM3	SCBA
0.05 [+ 0.05]	1000				FFM P3	
0.2	500				TH3	
0.5	200			TM2		
2	50		FAH HM	FFP3/TH2		
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8	12		FFP2			
10	10		TH1			
0.05 [+ 20]	5	FFM P1				
22	4	FFP1				

Sources: EN529; HSG53 Respiratory Protective Equipment at Work: A Practical Guide
Not all types/classes shown

ISO TIL, NPF and PLs

ISO %TIL	ISO NPF	PC1	PC2	PC3	PC4	PC5	PC6
		PL	PL	PL	PL	PL	PL
		4	10	30	250	2000	10,000
<0.001	100,000						
<0.01	10,000						
<0.1	1000						
<1	100						
<5	20						
<20	5						

ISO Protection Levels
- *potentially replace APFs*

ISO: Protection Levels

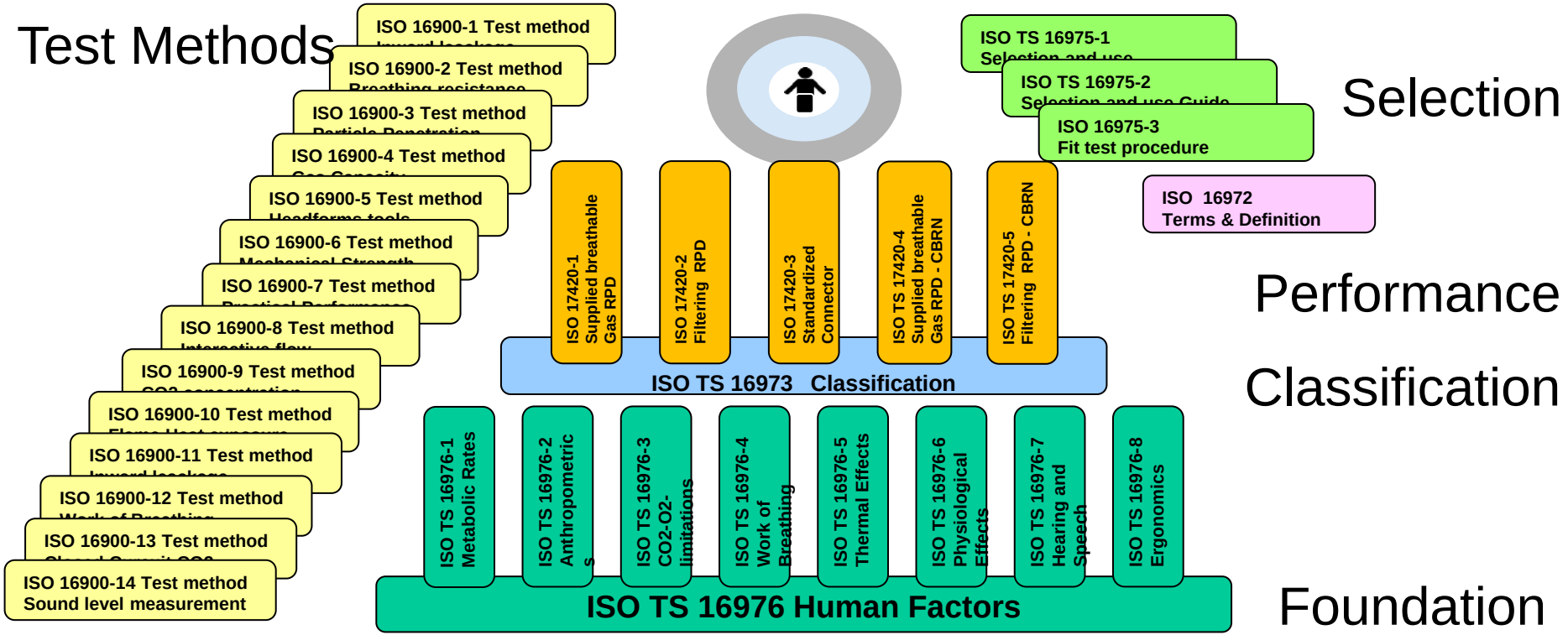
- *Degree of respiratory protection allocated for the purposes of selection…..*
- Introduced to harmonise ‘APF’ across ISO member bodies
- Derived from the application of safety factors to the TIL requirement
- Not derived from workplace study data
- **Subject to validation**

HSE stakeholder engagement

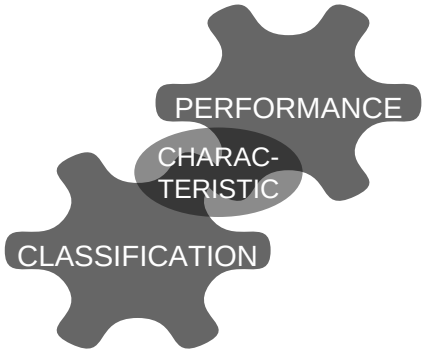
Validation of the proposed ISO protection levels

- Seeking RPE performance data from RPE manufacturers and users
  - WPF, SWPF, certification TIL data
- Participation in a multi-national programme of ISO PL validation testing
  - preliminary work on FFP conducted 2014/15
  - further RPE types

The new RPE Standards



ISO RPE classification



A completely new language!

Basic performance

=	**P**rotection **C**lass	6 5 4 3 2 1	Application **W**orkrate Class	4 3 2 1	**R**espiratory **I**nterface **RI** Class	e T/L d T/L c T/L b T/L a T/L	+

PC W

filtering

or

supplied breathable gas

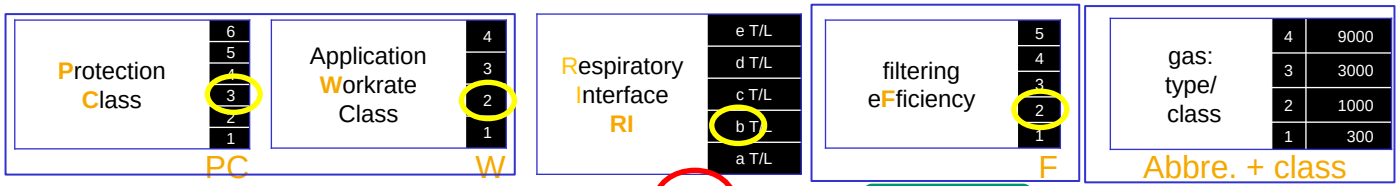
Special Application performance

Fire Fighting	CBRN	Mining	Marine	Abrasive Blasting	Welding	Escape
FF	CBRN	MN	MA	AB	WE	ES

ISO RPE classification - examples

Filtering RPE

Basis performance



Example for marking (Half mask + F) : PC3 W2 bT F2 AC3w2

(Full facemask + F) : PC4 W3 cT F3 AC2BC1w3

with standardized connector

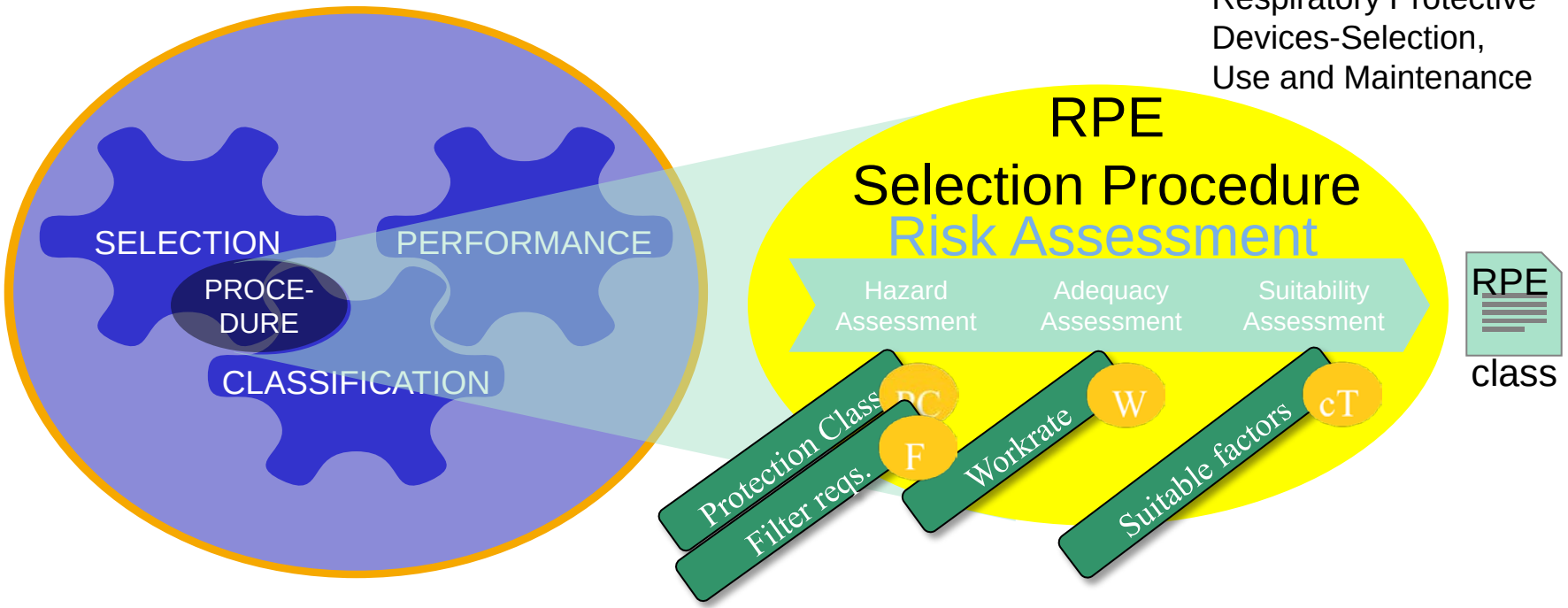
PC will replace current performance classes
e.g. FFP1, FFP2, FFP3, TH1, TH2,TH3, etc.

New filter classification and will replace ABEK etc. Gas filter will be Blue

TH3 ➡ PC3 W2 dL F3 w2

RPE Selection

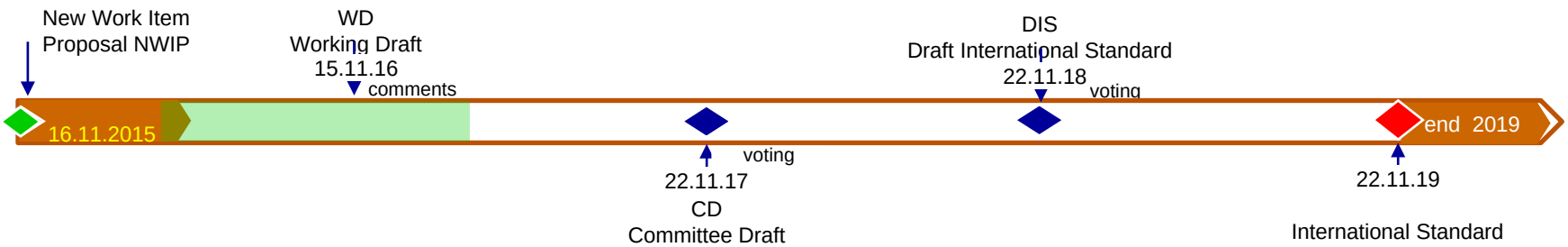
ISO TS 16975-1
Respiratory Protective Devices-Selection, Use and Maintenance



Timeline

ISO 17420-1 Respiratory protective devices – Performance requirements Part 1: Supplied breathable gas devices

ISO 17420-2 Respiratory protective devices – Performance requirements Part 2: Filtering devices



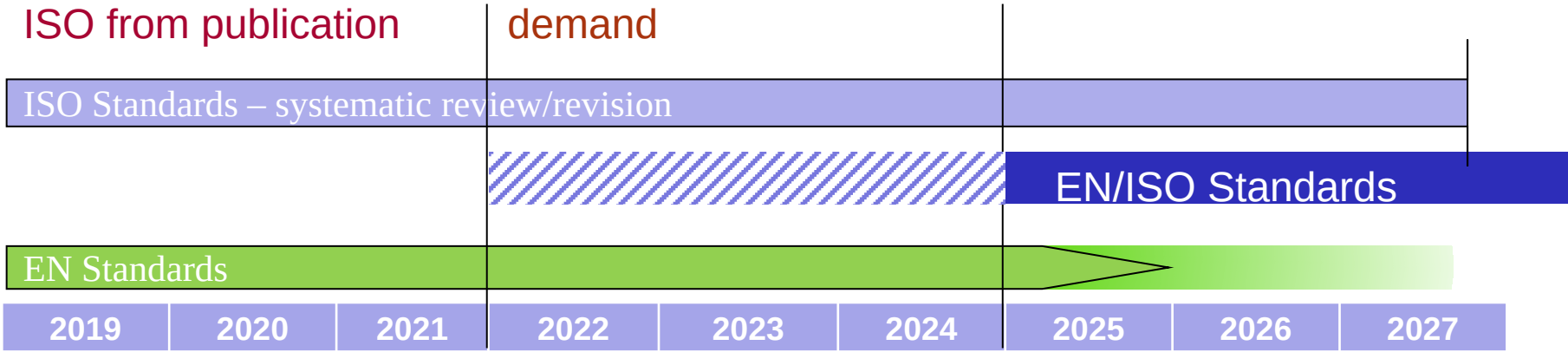
ISO implementation in CEN

Evolution period
ISO published
Adoption of ISO by CEN

Transition period
EN/ISO published
Existing ENs withdrawn

Notified Bodies could start to certify against ISO from publication

Earlier adoption as EN/ISO driven by market demand



HSL: HSE's Health and Safety Laboratory

Challenges ahead

- Encourage greater debate and understanding of the future RPE standards
- Change in RPE performance
- New terminology and marking – *new language*
- Major impact on RPE selection
  - work rate assessment
- Continue to validate the proposed ISO PLs and update APFs

Questions

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