



SANS 10339 – Comparison of existing versus proposed standards

Africa Underground Region – Civil Engineering

Contents

- Existing SANS 10339.
- Proposed SANS 10339.
- Classes of track.
- Principles adopted.
- Comparison of tolerances.
- Validation process.
- Results of validation.
- Residual risks.
- Way forward.



SANS 10339 – Existing Standard

- Issued 2000.
- Prepared by 'Underground Industry Experts'.
- Little or no representation from mines - the users.
- Prepared as 'Best Practice'.
- No minimum standard given.
- DME inspectors act as the 'traffic cop' – do not understand the concept best practice versus minimum standard.

SANS 10339 – Proposed Standard

- Aim is to issue September 2006 – optimistic though.
- Principle accepted by working group was to use minimum acceptable standard – derailments not acceptable.
- Working group members from:
 - Mining companies – gold and platinum.
 - Consultants experienced in underground track.
 - Manufacturers.
 - DME.
 - Labour not represented.
- Document exclude any clauses that don't add value.

Classes of Track

Existing Standard

- Class 1 track - 45km/hr
- Class 2 track - 25km/hr
- Class 3 track - 16km/hr
- Class 4 track - 10km/hr
- Class 5 track - 5km/hr

Proposed Standard

- High speed > 16km/hr
- Standard Speed \leq 16km/hr
- Low Speed \leq 5km/hr

Principles regards use of Proposed SANS 10339

- For **High Speed** track it is stated that a design must be signed by a Professional Engineer or Technologist.
- For **Standard** and **Low Speed** track if the tolerances and specifications given in the proposed SANS 10339 are met, this is deemed to meet design standards for conventional (ballasted) track.
- Other track systems are not excluded from use underground, however the design of other systems to be signed off by a Professional Engineer or Technologist.

Comparison of Tolerances - Retained Tolerances for Class 3 and Standard Speed Track

Tolerance	Existing	Proposed
Vertical Alignment	+10mm, -10mm	+20mm, -20mm
Horizontal Alignment	+10mm, -10mm	+20mm, -20mm
Super Elevation	8mm	12mm
Cross Slack - Twist	5mm	8mm
Gauge	+10, -3mm	+20mm, -8mm
Vertical Differential at Joint	<2mm	<3mm
Horizontal Differential at Joint	<3mm	<3mm
Joint Gap	<6mm	<6mm

Comparison of Tolerances - Excluded Tolerances – Class 3 Track

Tolerance	Existing	Proposed
True Level	+10mm, -10mm	Excluded
Gauge Widening	+5mm, -2mm	Excluded
Sleeper Spacing	+50mm, -50mm	Excluded
Circular Curves	+10mm, -10mm	Excluded

Validation Process for Proposed Tolerances

- This exercise done at AGA.
- Each mine choose a length of haulage that was believed to be the worst condition they would use to tram at 16km/hr.
- The track was measured in detail – 5m chord with a 2.5m overlap to the previous chord measured. Accepted Spornet measuring method.
- The results were compared to the proposed tolerances.
- Resulted in the twist tolerance being reviewed and made less stringent.

Result of Proposed Tolerances – Mine 1

Measured Track - 97 Level – 1km from shaft

Figures below indicate %age of measured section meeting standards

Existing SANS 10339		Proposed SANS 10339	
Class 1 Track	30%	High Speed	60%
Class 3 Track	77%	Standard Speed	87%
Class 5 Track	95%	Low Speed	96%

Result of Proposed Tolerances – Mine 2

Measured Track - 99 Level – near shaft
Figures below indicate %age of measured section meeting standards

Existing SANS 10339		Proposed SANS 10339	
Class 1 Track	36%	High Speed	53%
Class 3 Track	66%	Standard Speed	79%
Class 5 Track	83%	Low Speed	90%

Result of Proposed Tolerances – Mine 3

Measured Track - 120 Level – about 1km from shaft
Figures below indicate %age of measured section meeting standards

Existing SANS 10339		Proposed SANS 10339	
Class 1 Track	2%	High Speed	9%
Class 3 Track	10%	Standard Speed	28%
Class 5 Track	63%	Low Speed	90%

Result of Proposed Tolerances – Mine 4 - a

Measured Track - 95 Level – near shaft

Figures below indicate %age of measured section meeting standards

Existing SANS 10339		Proposed SANS 10339	
Class 1 Track	1%	High Speed	11%
Class 3 Track	28%	Standard Speed	64%
Class 5 Track	91%	Low Speed	98%

Result of Proposed Tolerances – Mine 4 - b

Measured Track - 95 Level – approximately 1km from shaft
Figures below indicate %age of measured section meeting standards

Existing SANS 10339		Proposed SANS 10339	
Class 1 Track	20%	High Speed	34%
Class 3 Track	48%	Standard Speed	75%
Class 5 Track	92%	Low Speed	95%

Result of Proposed Tolerances – Mine 5

Measured Track - 70 Level – E East double header main haulage
Figures below indicate %age of measured section meeting standards

Existing SANS 10339		Proposed SANS 10339	
Class 1 Track	2%	High Speed	9%
Class 3 Track	17%	Standard Speed	52%
Class 5 Track	77%	Low Speed	90%

Result of Proposed Tolerances – Mine 6

Measured Track - 59 Level – at the back of the mine
Figures below indicate %age of measured section meeting standards

Existing SANS 10339		Proposed SANS 10339	
Class 1 Track	11%	High Speed	42%
Class 3 Track	57%	Standard Speed	90%
Class 5 Track	98%	Low Speed	99%

Result of Proposed Tolerances – Mine 7

Measured Track - 1650 Level – near shaft
Figures below indicate %age of measured section meeting standards

Existing SANS 10339		Proposed SANS 10339	
Class 1 Track	0%	High Speed	0%
Class 3 Track	1%	Standard Speed	50%
Class 5 Track	83%	Low Speed	97%

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Residual Risks

- Tracks require maintenance – but significantly less than previously.
- DME inspectors need to get acquainted with new standards.
- Need to be able to measure track to prove if it meets the standard when challenged. This means objective assessment rather than subjective eyeballing.
- Upgrade & Maintain tracks to required standard.

Way Forward

Finalisation of the proposed updated SANS 10339

- Document to be reviewed by the u/g transport sub-committee – to be sent to them by mid April and sub-committee will have 3-4 weeks to comment.
- Draft document to be edited by SANS editors – 2 months
- Document to be placed on public comment – 60 days.
- Document to be reviewed by SANS internal process – 1 month.
- Any comments to be reviewed and incorporated as appropriate by the working group. Severity of comments will determine if repeat of the above is required.
- SANS target is to issue revised document September 2006 – This is an optimistic target - in SANS own words.

Questions

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