

Workshop on NDT Requirements for Heritage Railway Boilers

13 February 2018

Alresford Goods Shed, Mid Hants Railway



engineering safety, integrity & reliability

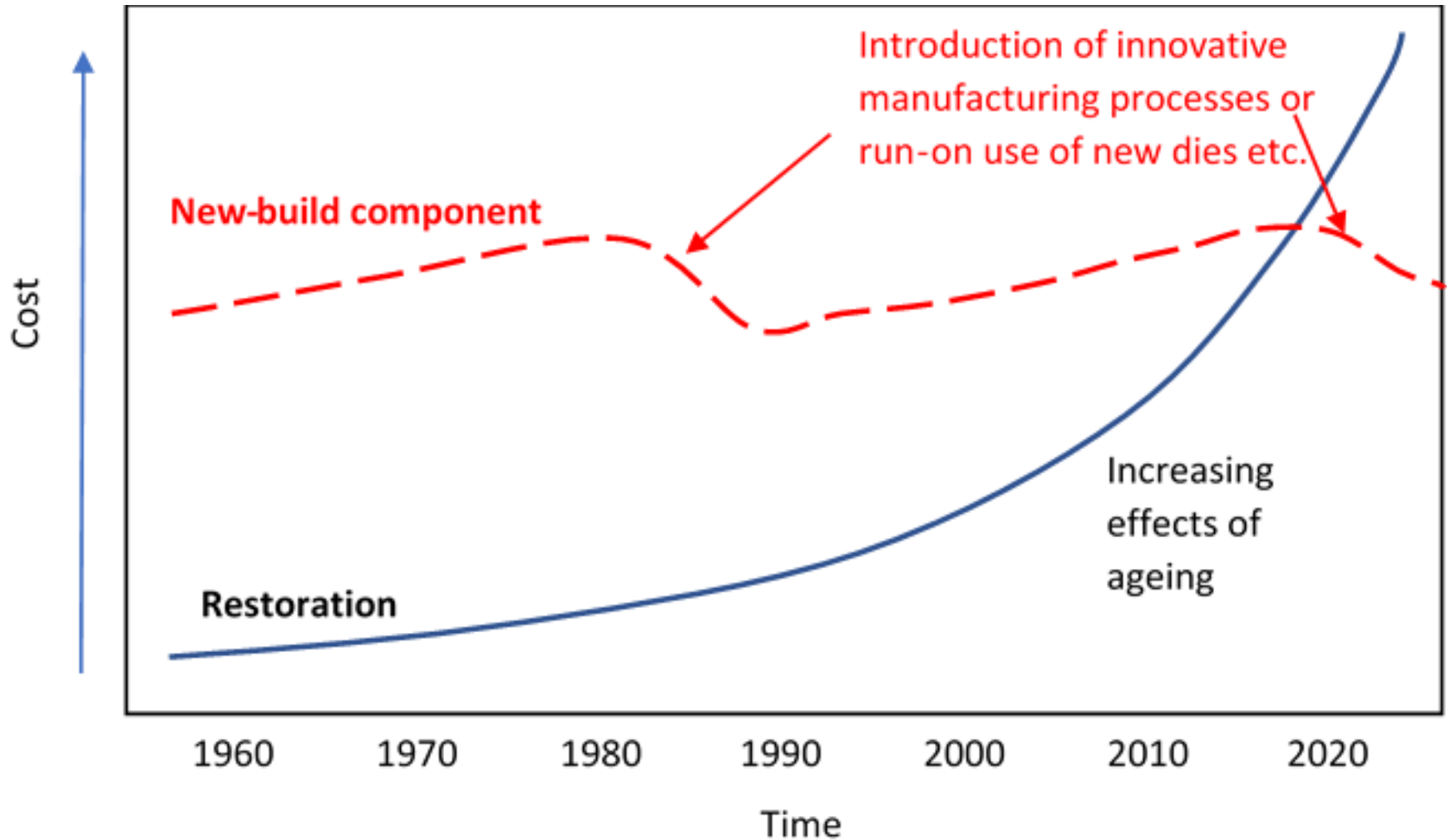


Robert A Smith

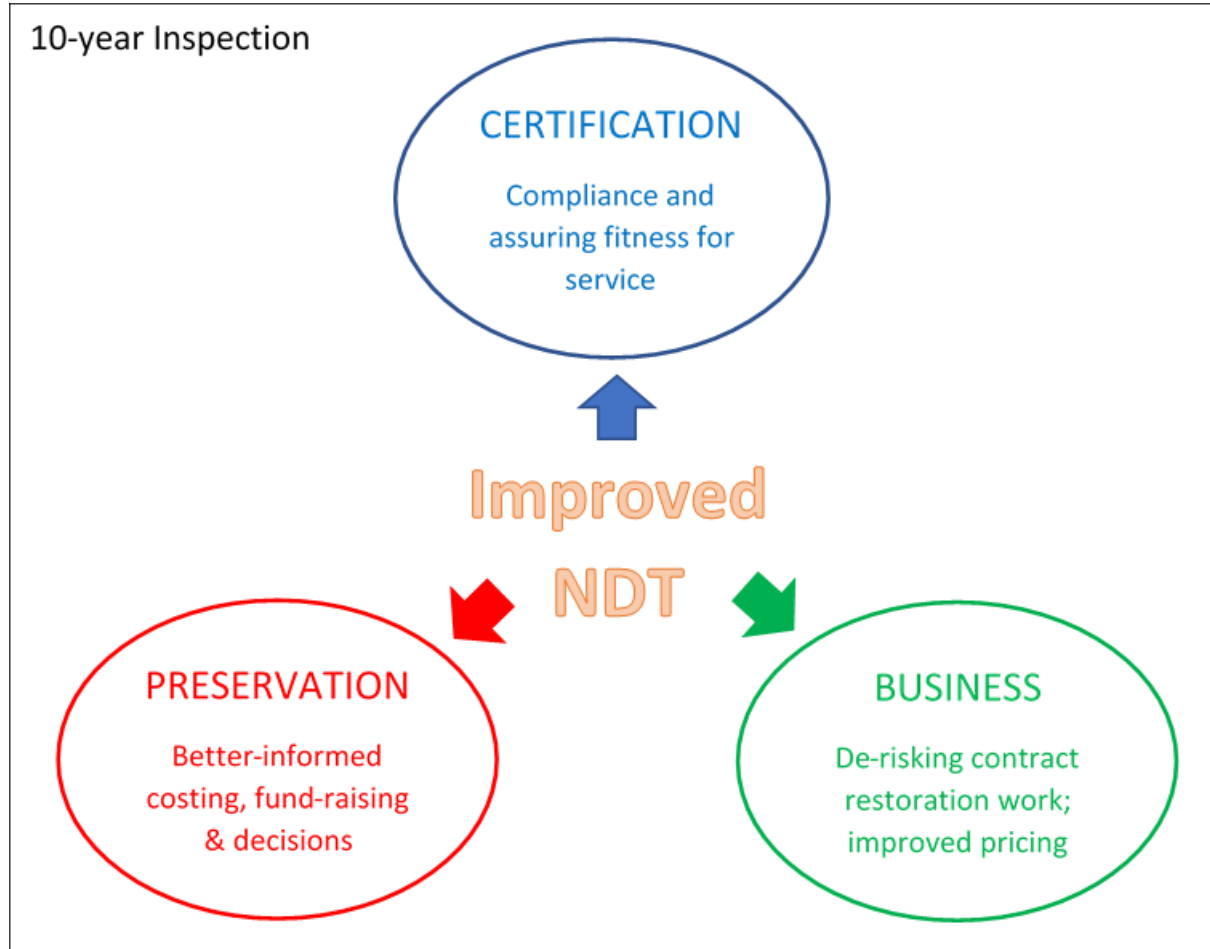
Professor of Non-destructive Testing, University of Bristol

Past President of the British Institute of Non-destructive testing

10.00	Welcome and Introduction – Alresford Goods Shed	Prof Robert Smith
10:05	Brief introduction to heritage railway steam boilers	Andy Netherwood, Mid-Hants Railway
10.10	Mitigating health and safety risks on heritage railways	Rob Le Chevalier, South Devon Railway
10:30	NDT: supporting tests for Risked Based Inspection	John Haigh, Allianz UK.
10:50	Internal Corrosion damage	Andy Netherwood, Mid-Hants Railway
11:10	Experience with ultrasonic NDT and boiler stays	Chris Shepherd, Bluebell Railway
11:30	Stress corrosion cracking and grooving	Chris Greatley, Kent and East Sussex Railway
11:50	NDT experiences	Carl Hamer, British Engineering Services
12:10	Discussion (recorded)	Chair: Prof Smith
12:30	Lunch and free time to explore Alresford / station	
13:30	Board 13:45 train for Ropley	Dr Becky Peacock
14:00	Split into small groups for viewing inspection scenarios, samples, etc. Discussions to be noted by each group leader.	Andy Netherwood and team
15:30	Tea and biscuits in workshop and free time in yard	
16:15	Head back to platform to catch 16:27 train for Alresford	Dr Becky Peacock
16:45	Panel session discussion of requirements (recorded), samples required, NDT validation and approvals process.	Chair: Prof Smith
17:30	Close	



10-year Boiler Inspection



- Large-area corrosion mapping
 - Full assessment of boiler-plate condition
 - Informed repair/replace decisions
 - Informed cost of refurbishment
 - Less expensive to achieve acceptable risk
- Customised inspections
 - Reduced preparation (removal of corrosion product, lagging, etc)
 - Reduced cost of inspection



- Map remaining wall thickness due to corrosion
 - Large-area ultrasonic scanning from smooth side avoiding stay heads.
 - EMATS for non-contact ultrasonic scanning to
 - Laser Ultrasound (needs a good surface though)
 - Pulsed eddy-currents as used for corrosion mapping for 1"-thick steel pipes under up to 3" of lagging.
- Stay inspection
 - Use of different ultrasonic coupling methods to inspect without treating the surface of the head.
 - Instrumented 'tap' or resonance test.

Desired workshop outcomes

- Bound the scope of the NDT requirements
 - Material types and geometries
 - Defect types and sizes
 - Access restrictions (lagging, rivet-head spacing, etc)
 - Cost of inspection vs benefit of de-risking refurbishment
 - Plan a way forward
 - Working group – BINDT-based or HRA-based, or both?
 - Samples for technique validation – number, size, etc
 - Trials of new techniques on samples – funding unlikely
 - Technique writing, Validation & Technical Justification exercise
 - Technique sign-off and implementation
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