

WILD (Wheel Impact Load Detector)

WILD (Wheel Impact Load Detector) systems were developed jointly by RDSO and IIT, Kanpur in the year 2005.

Over the years 15 sites were installed on the Indian Railways.

In the first phase WILD system were installed at Mahalimarup(CKP), Hospet (Karnataka), Arakkunam (tamilnadu), Bhilai (Chattisgarh), Guntukal (Andhra pradesh), MGS, ASN and VSKP.

In the second phase, they were installed at Itarsi, Bina, Ajani, Katni, Nagpur and Barwadeh.

WHAT IS WILD

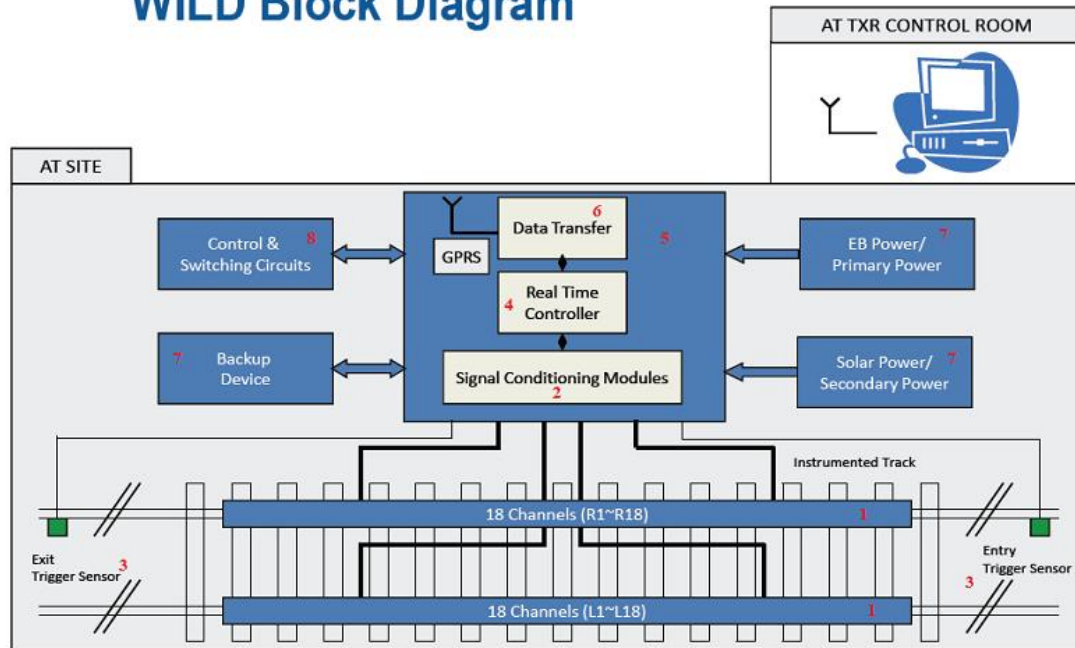
The Wheel Impact Load Detector is a set of rails instrumented with strain gauges. The system uses strain gauges stuck on the web of the rail to measure the shear strain from which the corresponding shearing load (the wheel load) is determined. The strain gauges are connected to a data acquisition system which acquires data, computes the values and relays these to the internet based servers.

Components of WILD

Following are the components of WILD –

1. Instrumented Tracks
2. Signal conditioning unit
3. Train Trigger Sensor
4. Real time Embedded controller
5. Impact Load Analyzer Software
6. Wireless data transfer
7. Power back up
8. Calibration Setup

WILD Block Diagram



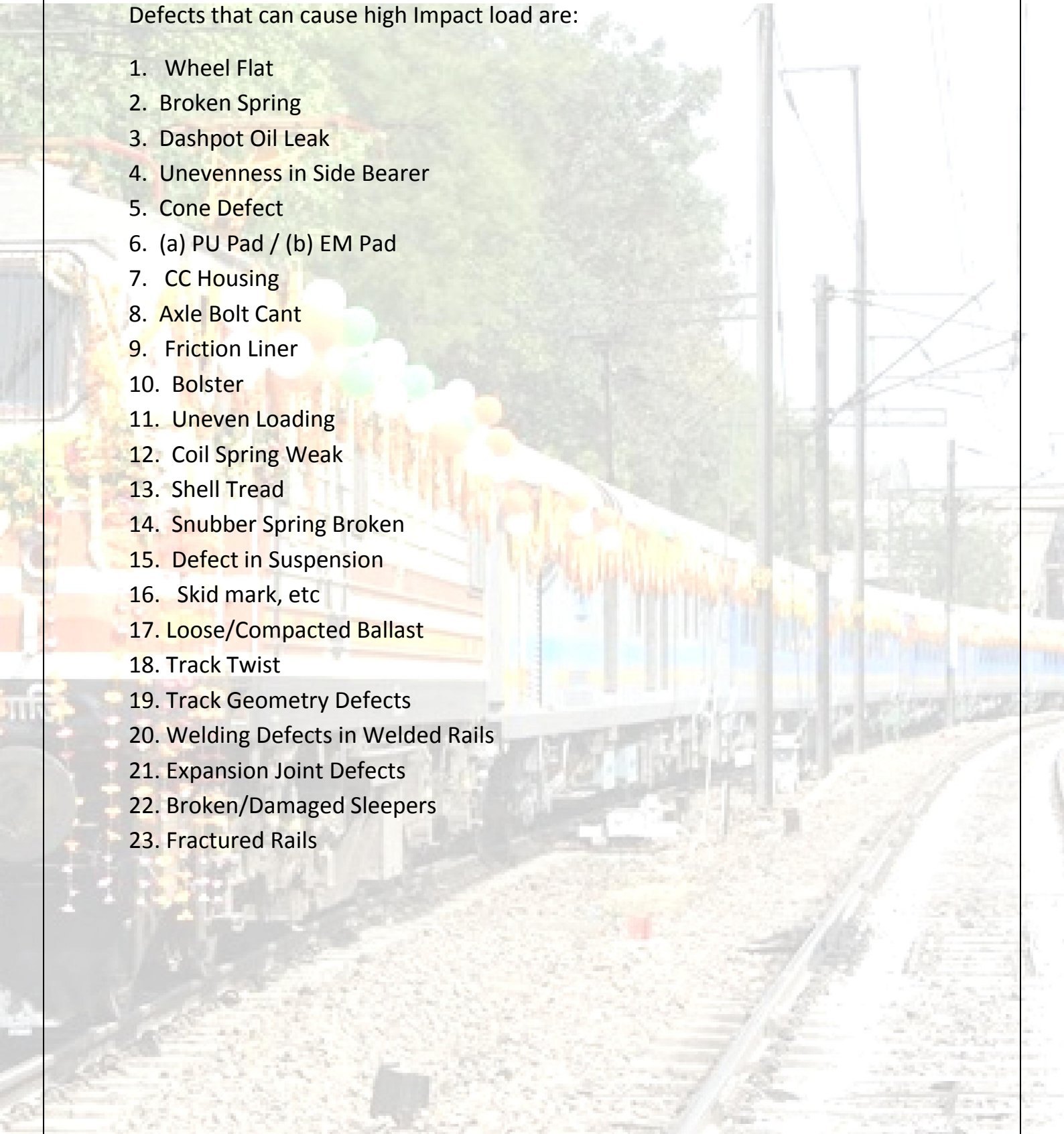
NEED FOR WILD

- Defective rolling stock produces high impact loads.
- These loads over a prolonged period of time, leads to Rail/Wagon failure, wheel bearing failure etc.
- WILD measures impact load independent of the cause.
- WILD system assists railway engineers to attend to the defective rolling stock immediately.
- WILD reduces Service Failures and Unplanned Maintenance Cost of Rolling Stocks & Tracks.
- WILD is used to catch the defects in the early stage and thereby protecting Rail Infrastructure & avoids Catastrophic Failures.

CAUSES OF HIGH IMPACT LOAD

Defects that can cause high Impact load are:

1. Wheel Flat
2. Broken Spring
3. Dashpot Oil Leak
4. Unevenness in Side Bearer
5. Cone Defect
6. (a) PU Pad / (b) EM Pad
7. CC Housing
8. Axle Bolt Cant
9. Friction Liner
10. Bolster
11. Uneven Loading
12. Coil Spring Weak
13. Shell Tread
14. Snubber Spring Broken
15. Defect in Suspension
16. Skid mark, etc
17. Loose/Compacted Ballast
18. Track Twist
19. Track Geometry Defects
20. Welding Defects in Welded Rails
21. Expansion Joint Defects
22. Broken/Damaged Sleepers
23. Fractured Rails

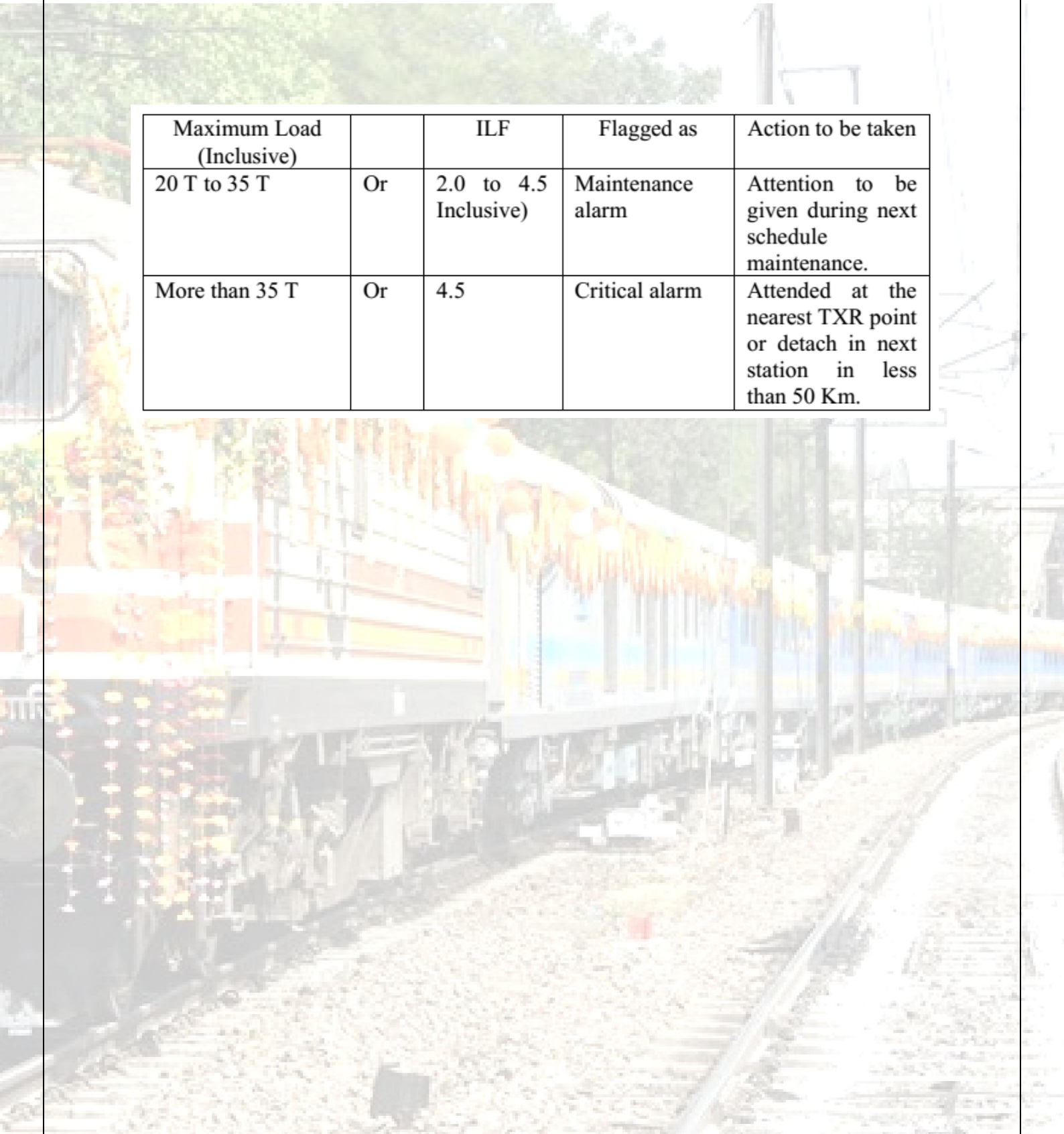


WORKING OF WILD

- WILD uses instrumented rails.
- The space between sleepers is instrumented using strain gauges and any load that appears in the effective zone is considered.
- Various such measuring zones are formed along the track.
- The maximum load measured in all instrumented portion is treated as the impact load.
- As wheel rolls over the rail, various portions of the wheel fall in the effective zone and dead zone (sleepers).
- As a result various diameters of wheel have different coverage.
- The instrumented portions can be determined and prepositioned to give best coverage for the wheels of interest.
- Once installed the system's wheel coverage pattern does not change.
- Each channel produces a portion of load profile for all the wheels.
- Accumulating all the data, a complete load profile of the wheel is obtained.
- The maximum load detected by the channels is primarily used to flag the defective axle/wheel.
- Wild system flags the defects purely based on the impact load measured.
- The limit is set by the RDSO/Railway board.
- The system however features a facility for the end user to set the Limit

Impact load limits

Maximum Load (Inclusive)		ILF	Flagged as	Action to be taken
20 T to 35 T	Or	2.0 to 4.5 Inclusive)	Maintenance alarm	Attention to be given during next schedule maintenance.
More than 35 T	Or	4.5	Critical alarm	Attended at the nearest TXR point or detach in next station in less than 50 Km.



REPORTS IN WILD

- The WILD System offers the end user to generate various reports. Month wise, Year wise, Train wise & Wheel wise standard reports available.
- Provision for new standard reports.
- Summary reports can be drawn out based on
 - ✓ Wheel loads
 - ✓ Rolling stock (Engine, Wagon, Tanker etc.)
 - ✓ Defective rolling stock
- Master Mode
 - ✓ All train reports
 - ✓ Consolidated reports
 - ✓ Alarm log reports
 - ✓ Wheel wise analysis
 - ✓ Train wise analysis
- TXR Mode
 - ✓ Latest train report
- Data Entry Mode
 - ✓ Feedback for the alarm